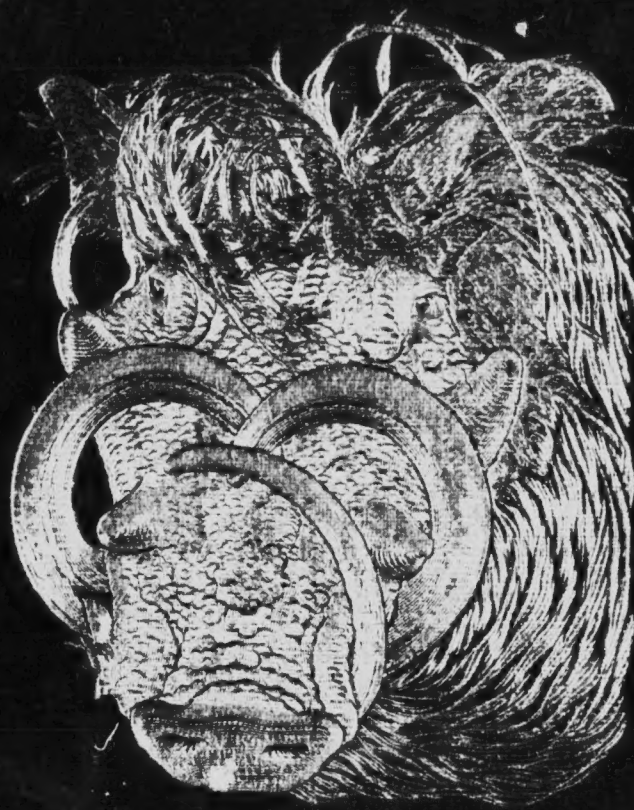


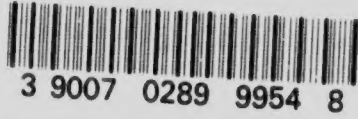
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MORE WILD ANIMALS & THE CAMERA

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W. P. DANDO F.Z.S.



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ANIMAL AILMENTS HAVE GREATLY HELPED
TO RELIEVE THE SUFFERINGS
OF OUR DUMB
FRIENDS.



PREFACE

WHEN I offered to the public "Wild Animals and the Camera," I depended almost entirely for any success my humble efforts might receive upon the reproductions of my photographs of animal studies, some of which were taken under circumstances that induced me to hope they would be appreciated as combining the artistic as well as the technical side of photographic art. That my aspirations have been more than realised is proved by the number of congratulatory letters I have received from all parts of the world; the only adverse criticism referred to the brevity of the description of the animals.

In "More Wild Animals and the Camera" I have given as full a description as the space at my command will allow, and in the execution of this task the aim has been simplicity and accuracy, combined with interesting and useful details. Technical forms of expression have been avoided as much as possible, and where technical words were deemed the most applicable they have been explained. More attention has been paid to clearness than to the following of any

single species into minute details, and although prominence and space is given to the *Canidæ*, the excuse must be the popularity of the domesticated species of this interesting family.

Little that is new to the science of zoology would be expected from the writer, but still I hope there will be found many instances in which the investigations have been carried somewhat farther than is usually done in a book intended for the general reader, although it is hoped this volume will not be deemed unworthy of a place in the library of the professed naturalist.

Style, in a popular work, is of secondary consideration, and the qualities that have been aimed at are simplicity and vigour, rather than polish and ornament. The introduction of the scientific names of the animals, which are printed in italics, is with a view to identifying the animals by those foreign readers who may be unfamiliar with the English name of the animal.

I should like to express my thanks to all those gentlemen who so kindly wrote to me on the publication of my previous efforts.

W. P. D.

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PART I
MAMMALS



PART I. MAMMALS

CANIDÆ

MANY naturalists are agreed that all the various kinds of domestic or wild dogs, jackals, foxes, wolves, and the dingo of Australia, form but one distinct family of beasts: CANIDÆ. This family is but one of several which, grouped, form the "order" of "Beasts of Prey," otherwise *Carnivora*, which, with some sixteen other orders, constitute the class MAMMALIA, *i.e.*, animals which suckle their young, and the highest form of vertebrates. The *Canidæ* offer most interesting study from the fact that the domestic dog shows very little analogy in its characteristics to the wild progenitors which are stated to be its origin. When we consider that Darwin has his doubts as to the genesis of the domesticated dog, although his immortal authority has traced almost beyond dispute

the descent of man, any infinitesimal fact which may lead to the solving of the origin of the one animal above all that is loved by man must be useful and interesting.

Darwin, in his "Descent of Man," writes as follows: "The majority of rising men will feel, no doubt, that all the races of man are descended from a single primitive stock; whether or not they may think fit to designate the races as different species for the sake of expressing their amount of difference. With our domestic animals the question whether the various races have arisen from one or more species is somewhat different. Although it may be admitted that all the races, as well as all the natural species within the same genus, have sprung from the same primitive stock, yet it is a fit subject for discussion whether all the domestic races of the dog, for instance, have acquired their present amount of difference since some one special was first domesticated by man; or whether they owe some of their characters to inheritance from distinct species, which had already been differentiated in a state of nature. With man no such question can

arise, for he cannot be said to have been domesticated at any particular period."

No animal, if, indeed, all belong to one original genus, varies more than that which is the most domesticated of any—the dog; *cf.* the St. Bernard, weighing about 180 pounds, with its magnificent coat of curled hair almost as thick as the fleece of a sheep, with others weighing only a few pounds and perfectly hairless, such as the dog of Mexico and the Turkish dog (*Canis familiaris aegyptius*). Others again are slender, with long muzzles and legs, remarkable for their velocity and the quickness of their sight. Whoever studies the diversified functions which the dog exercises in our service as our faithful companion, watchful guardian and defender of our property, and the minister to our pleasure, must acknowledge the wisdom, goodness, and the power of the Creator in the production of so versatile a race, applicable in so many ways to such a variety of purposes, many of them of the first importance to mankind.

Without dogs some nations would have no means of conveyance from one place

to another,¹ and others would scarcely be able to supply themselves with food.² Any facts, therefore, which may help to solve the problem of what was the first origin of the domestic dog must be interesting, when we consider the remarkable and curious abnormalities of structure and the distinct characteristics of the various breeds.

The term "dog" is used in a broad and general sense to designate such animals as wolves, foxes, jackals, the dingo of Australia, and the wild and domesticated dogs. However insoluble the origin of the latter may be, one remarkable fact is established (genealogically speaking)—that in a very brief period descendants of the same stock have become either extraordinarily diversified from all those animals to which they are accredited with being most nearly allied in both form and habits, or the "crossing" of the offspring of species originally distinct has resulted in the production of a race universally prolific, divided into innumerable species, each of which breeds true to type.

¹ The Kaintchadales of Siberia.

² North American Indians, Esquimaux, &c.

The great variety in size and form of the domesticated dog gives mankind a choice whereby every peculiarity of taste can be satisfied; whether it be as to shape, colour, texture of coat, or other characteristics associated with sport, pleasure, usefulness, or the endurance of extremes in climatic temperatures, these characteristics render the dog the most esteemed, useful, and interesting animal all the world over.

As a digression, an important analogy, which to my mind goes to prove that domestication is not the primary factor which, as some naturalists argue, is responsible for the domestic dog in all its varied phases, I call attention to the cat. The cat, though everywhere domesticated, exhibits no other differences than in the textures and colour of her fur. This favourite nocturnal quadruped, we must recollect, is principally employed to destroy those minor animals that are noxious in and about our houses. Impelled and solely led by that instinct, domestication has added nothing to her savage nature, like that of her congeners, the *Felidæ*. The thousands of years of domestication have

not instructed her to assist man like the dog, as the companion of his sports in various ways. No; she only exercises her single function, always in the same way, and under the same influence.

When we further recollect that the domestic cat all over the world resolutely follows the general habits of the genus to which she belongs, which appear subject to very trivial modification arising from altered circumstances, and that all animals that do follow in the train of man are equally constant, may we not infer that the Creator has gifted them with the capability of improvement and the development of latent qualities not apparent in them when in a wild state? May not this reasoning prove that diverse environment and countless ages of domestication have done nothing for the feline animals, equally as intelligent as the wild *Canidæ*, although naturalists assert that it has changed the wolf into the only true and faithful friend of man, whose love for his master is not shaken by ill usage, because the dog looks upon man as his god, whom he has followed all over the world.

In illustrating and writing around the groups of animals included under the above heading, the writer is placed in a somewhat awkward position from the fact that "the friend of man" finds place as one of the *Canidae*, although the domesticated dog herein referred to cannot be called a "wild animal." The author, having been for many years the Hon. Secretary of the oldest canine specialist club in the world, the Bulldog Club (Incorporated), and a member of the Council of representatives of the Kennel Club, has been requested by many readers of his previous publications to include a chapter in this volume tracing the history of the domesticated dog; but as it would be impossible and out of place to give prominence to more than one breed in a book devoted to wild animals, the author will only make mention, in anything like detail, of what he considers the best "pal" in the world. The Bulldog is known all over the world as the national breed of England, and the most affectionate and attached to man. There are multitudinous types of dogs, of which about fifty distinct breeds have clubs or associations to watch

over each variety and encourage the breeding up to the standard of points accepted by the particular "fancy," such as, for instance, the Bulldog Club (Incorporated), whose committee compiled and adopted "The Standard of the Bulldog" in 1875. The popularity of the dog cannot be better exemplified than by quoting the figures at the London Crystal Palace Kennel Club Show, 1911: 3,346 entries were made in the seventy distinct classes open to the public, whose enthusiasm for its pets may be gauged from the fact that the entry fee at this show is £1 each class.

There are still some naturalists who believe that the domestic dog, with its numerous breeds, descended from a distinct species, which no longer exists in a wild state; others have endeavoured to find its progenitors in some one of the wild or feral races. The question, What was the parent stock of the faithful friend of man? still remains unanswered. One circumstance should be borne in mind, and that is that none, even of the wild dogs which live apparently in a state of nature, have ever been found to throw back and return

to the true form of wolf. Again, the wolf or fox, when taken during the period of its ten days' puppy blindness, is gentle only during that early period of its life, but even while a cub snarls and growls, but never barks like the dog ; as they grow older they give themselves up to their natural appetites of rapine and cruelty. One argument which seems sound, favouring the theory of the identity of the dog with the wolf, is the fact that the period of gestation in both animals is sixty-three days. The young of both wolf and dog are blind, and see at about the same time, viz., at the expiration of the tenth or twelfth day. The tongue is also soft, by which organ both animals perspire ; the ears, however, of the wolf and all wild *Canidæ* are erect, whereas in the domesticated dogs they are usually pendulous ; the forefeet have five toes and the hind four, and the claws of both are non-retractile.

The period at which the domestication of the dog took place is wholly lost in antiquity. The earliest mention of the dog is found in Scripture, and occurs during the sojourn of the Israelites in Egypt :

"But against Israel shall not a dog move its tongue." Dogs are again mentioned in the Mosaic law in a manner which would seem to show that they were the common scavengers of the Israelitish camp, as they are still in many cities of the East: "Neither shall ye eat any flesh that is torn of beasts in the field; ye shall cast it to the dogs." A similar office seems to be alluded to repeatedly in the course of the Jewish history: "Him that dieth in the city shall the dogs eat." A common curse, as it would appear, as it occurs verbatim in no less than three separate places in the 1st Book of Kings, and evidently intimates a violent and disgraceful death, without the honour of sepulture. The expressions of scorn and contempt with which the dog is referred to in the Old Testament surely indicate that domestication had not at that period evolved an animal approaching in domesticity the dog as we know it; it contrasts strangely with the reverence with which the dog was regarded by the ancient Egyptians, among whom the Jews sojourned so long.

That the dog was held in great venera-

tion by the ancient Egyptians is shown by the following: At one city, Cynopolis, it received divine honours; and we read of a civil war between the inhabitants and those of a neighbouring town, because the latter profanely killed and ate the sacred animal. When a dog died all the inmates of the house shaved their heads and their whole body, and if any food happened to be in the house at that time, it was forbidden to be applied to any use.

Contrast the above adoration for the dog, which, thousands of years ago, was undoubtedly recognised by the ancient Egyptians as the friend of man, with the disgusting animal which the Israelites knew and described as the dog, and which they only mention with scorn and contempt and regarded as unclean.

The story of Jezebel, the wife of Ahab, King of Israel, illustrates the dissimilarity between the dog as we know it and the dog of biblical times. Jezebel seems to have undertaken the utter abolition of the worship of the Lord in Israel, by persecuting His prophets, all of whom would have been destroyed had not some been saved

by good men. The people having killed four hundred and fifty of Baal's prophets, Jezebel sent to Elijah at Mount Carmel, declaring that she would the next day take care that he was dispatched. Elijah prophesied that Jezebel should be eaten by the dogs in the field of Jezreel ; or according to the Hebrew, by the *outward wall of* Jezreel, where her body was thrown out of a window and left exposed : "and they went to bury her, but they found no more of her than the skull, and the feet, and the palms of her hands." So numerous were the "dogs" that at a single meal they speedily dispatched their disgusting business. It must not, however, be forgotten that when burial was denied it was the custom to kill first by the sword, hew the body to pieces, and scatter them about the streets.

To the English ear it sounds very surprising that so many dogs should be at one spot ready to devour so much at a single meal in the very midst of the royal city, close under the royal gateway, where a considerable train of people were constantly passing. It was, however, a common, every-



day occurrence in Eastern countries for human beings to be *hewn to pieces and scattered about the streets*. Mr. James Bruce, the great explorer and discoverer of the source of the Blue Nile (1770), writes: "I was miserable and almost driven to despair at seeing my hunting dogs, twice let loose by the carelessness of my servants, *bringing into the courtyards the heads and arms of slaughtered men*. I could in no way prevent this, but by the destruction of the dogs themselves."

In those times few people in the East went out after dark; the dogs therefore enjoyed the streets to themselves and seemed ready to dispute the possession of the city with the inhabitants. Bruce continues: "Often when I went home late from the palace, and it was this time that was chiefly chosen for conversation, though I had but to pass the corner of the marketplace, had lanterns with me, and was surrounded with armed men, I heard them grunting by twos and threes, so near to me as to be afraid they would take some opportunity of seizing me by the leg. A pistol would have frightened them, but the

discharging of firearms in the night would have alarmed everyone in the town. I at last scarcely ever went out, my only thought being to escape from the bloody country."

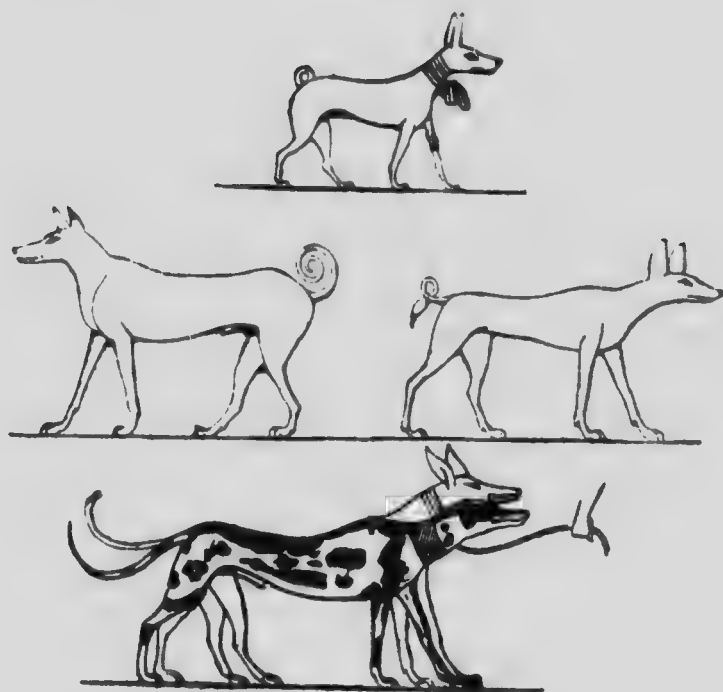
Can it reasonably be believed that the dogs above referred to, which the Israelites held in abomination and are never mentioned in Scripture except with disdain and disgust, and were classed among the unclean animals, were the progenitors of the domestic dogs of to-day? Should we not look to the ancient Egyptians as possessing the first domestic dog, the origin of which was a distinct genus, of which we are still ignorant, and possessing the characteristics which have been developed by man—characteristics which apparently are not latent in any degree in the wolf, and therefore could not be brought out or cultivated from the progeny of *Canis lupus*.

Sir J. Gardner Wilkinson in his great work, "Ancient Egyptians," 1836, gives several illustrations and accounts of several varieties of hunting and pet dogs, some only used for the chase, others admitted

into the parlour or as companions of their walks, and some, as at the present day, well chosen for their peculiar ugliness. The most common kinds were a sort of fox-dog and a hound. They also had a short-legged dog, not unlike our turnspit, which was a great favourite, especially in the reigns of the Osirtasens; and as in latter days the choice of a king or some noted personage brought a particular breed into fashion.

The reproduction on the next page of the Egyptian huntsman carrying home the game with his coupled dogs is from Thebes, in Upper Egypt, which is said to have been the magnificent capital of Egypt, 1600 B.C., and was ruined by Cambyzes, King of Persia, 525 B.C.

As a subject intimately connected with zoology in general and leading to a very profitable study of the Animal Kingdom from a moral point of view, a few remarks upon the division of animals into clean and unclean, observable in many parts of Holy Writ, will not be out of place. This distinction was originally made to indicate those animals which might or



VARIOUS KINDS OF DOMESTICATED DOGS.
From the ancient Egyptian sculptures.



AN EGYPTIAN HUNTSMAN CARRYING HOME THE GAME
 WITH HIS COUPLED DOGS.

might not be offered up in sacrifice, and afterwards, when animal food was permitted, to signify to the Jews those that might or might not be eaten. When Noah was commanded, "Of every clean beast thou shalt take to thee by sevens, the male and his female; and of beasts that are not clean, by two, the male and his female" (Gen. vii. 2), it is evident that the distinction was familiar to the Patriarch. The unclean animals, with respect to their habits and food, belong to two great classes, namely *zoophagous* animals, or those which attack and devour *living* animals, and *necrophagous* animals, or those which devour *dead* ones or any other putrescent substances. Of the first description are the *Canidæ* and *Felidæ* among quadrupeds. The domestic dog is classed among the former, but cannot be considered as an animal which attacks and devours living animals, yet the domestic cat of to-day has not lost this propensity.

The mystery of the origin of the dog as we recognise it is not solved by Darwin in his "Origin of Species." On the contrary, this great authority suggests that there

existed some distinct species as the progenitors of certain domestic dogs. Early in Vol. II. he writes as follows: "If we turn to varieties produced, or supposed to have been produced, under domestication, we are still involved in some doubt. For when it is stated, for instance, that certain South American indigenous domestic dogs do not readily unite with European dogs, the explanation which will occur to everyone, and probably the true one, is *that they are descended from aboriginally distinct species.*" Again he writes, also in Vol. II.: "Some authors who have written on dogs maintain that the greyhound and the bulldog, though so different, are really closely allied varieties, descended from the same wild stock; hence I was curious to see how far their puppies differed from each other. I was told by breeders that they differed just as much as their parents, and this, judging by the eye, seemed almost to be the case; but on actually measuring the old dogs, and then six-day-old puppies, I found that the puppies had not acquired nearly their full amount of proportional difference." Who could dispute

Darwin on his "Laws governing the Sterility of First Crosses and Hybrids"?

It is a most remarkable fact that the domestic dog has learnt to bark in at least half a dozen different tones: there is the bark of eagerness, as in the chase; the growl of anger; the howl or yelp of despair, as when abandoned or kept in confinement; the bark of contentment or joy, familiar to all who take their dogs out on a walk; and the inexplicable baying at night, which Shakespeare observes in the following words: "I had rather be a dog and bay the moon than such a Roman" ("Jul. Cæsar," iv. 3); and the supplicating cry when asking for a door to be opened, which is distinct from all other sounds emitted by the dog. There is also a peculiar *mezza voce* screech which I have observed effuse from my dog on seeing some strange and unfamiliar object move in the distance, as if animated by that spiritual or living essence which savages imagine animates all natural objects and agencies.

A dog that fears no living animal, be it man or beast, will show signs of extreme nervousness, and absolutely tremble with

fear, on seeing, at the "witching time of night, when churchyards yawn, and Hell itself breathes out contagion to the world," forms imaginary or invisible to man, or maybe some inanimate object moved by a slight breeze on an otherwise still night, or appearing in the moonlight, in some uncanny shape which strikes terror to the fertile brain of the "friend of man," whose fallacy of vision conjures up some form unknown to us at which to take affright. Darwin observed that the dog's mental faculties were easily unbalanced by the mere movement of an inanimate object when no human being is standing by it. Must not the dog have reasoned to himself, in a rapid and unconscious manner, that movement without apparent cause indicated the presence of some strange and invisible living agent?

The dog possesses a feeling of religious devotion for his master, consisting of love, complete submission to his exalted and mysterious superior, combined with dependence, fear, reverence, gratitude, and perhaps other elements. The behaviour of a dog on the return of its master after

an absence is widely different from that exhibited towards its kind, even though it be one with which it is on the most friendly terms, that returns to its kennel companion and mate. There are not the same signs of adoration exhibited—nothing, in fact, to show more than a promiscuous tolerance, in contrast with reverence shown by the dog to its master, which is certainly a propensity previous to experience and quite independent of instruction, yet permanent and unaffected by years of absence, as many trustworthy records will show.

The courage of the dog is unbounded, a property not possessed by the wolf. He appears never to forget a kindness, but soon loses the recollection of an injury if received from the hands of the one he loves, but resents it if offered by a stranger. His docility and mental pliability exceed those of any other animal; his habits are social and his fidelity not to be shaken—hunger cannot weaken nor old age impair it. His discrimination is equal in many respects to human intelligence, and should he commit a fault he does not try to hide

it, but shows pleasure only when forgiven. These and many other qualities which might be enumerated did space permit are distinct from those possessed by the wolf. It will, I know, be argued that domestication and the effect arising from artificial habits and breeding through a long succession of years have produced these characteristics in the dog. This may be doubted, and is not likely to be proved. The fact is, the dog would appear to be a precious gift to man from a benevolent Creator, to become his friend, companion, protector, and the indefatigable agent of his wishes. While all other canine animals have the fear and dread of man implanted in them, the poor dog alone looks up to his master with affection, and the tie once formed is never broken.

It is accredited to Buffon that he successfully mated the wolf and the dog for four generations. This assertion is really of no value, from the fact that the experiments have not been carried sufficiently far, and we have no recent evidence that the hybrids were fertile *inter se*.

Professor Jeitteles contends that what-

soever otherwise may have been the origin of the dog, the jackal and wolf (the variety *Canis pallipses*) have been the parents respectively of the domestic dogs of neolithic and stone periods of human existence in Europe (see *Proc. Asiat. Soc. of Bengal*, 1877, p. 114). The worthy Professor grounds his opinion on a consideration of the teeth and formation of the skull. Mivart, in his great work on dogs, jackals, and wolves and foxes, in commenting on the above assertion, states: "Such evidence is to us profoundly unsatisfactory; and therefore, while we have no reason or disposition to dispute the truth of his view, we can only regard it as conjecture."

Take again the opposite opinion of that great naturalist, Professor Dr. John Waldrich: he thinks that the "domestic dog of Europe can no more be traced to existing wild European species of jackal, wolf, or fox, than the existing European races of man can be traced to wild tribes." He thinks that the ancestors of the European dog no longer exist in Europe, and suggests the probability of their derivation from diluvial predecessors.

Rengger states, in speaking of the domestic dogs of America: "It is certain that at the time of its discovery the natives of America had already a race of domestic dogs. Such were found by Alonso Herera in New Granada and by Garcilasso in Peru." Mivart sums up the opinions of the greatest authorities of the world by stating: "It seems to us, however, impossible to determine whether such races really originated from the wild species of the New Continent or were brought by man from Asia in very ancient times."

It must be remembered that the wolf has oblique eyes, whereas the eyes of dogs have never retrograded to that position. If the dog descended from the wolf, a constant tendency would have been observed in the former to revert to the original type of species. This is the law of other cross species, but among all the varieties of dogs this tendency does not exist. It is known, too, that the number of teats of the female dog vary, some having more and others less than the she-wolf, the teats of which have never, so

far as I can ascertain, been known to vary.

The arguments and opinions which I have brought forward to show that the dog is a breed *sui generis* will, I hope, lead to expressions of opinion from naturalists of to-day and establish the theory I am ventilating, and elevate our faithful friend above the stigma cast upon its grand nature, by associating its origin with that opprobrious, rapacious, and detestable creature the wolf.

WOLVES

THE PRAIRIE WOLF (*Canis latrans*) or Coyote, as the Mexicans call this small species of wolf, is met with, even to-day, over a very large range of country. At one time these cynoid carnivora were to be found all over North America, from Costa Rica to Canada. They have been exterminated from the greater portion of the United States, and have entirely disappeared from Kansas and along the plains, where they were found in abundance seventy-five years ago. Its extreme cunning and wariness make it a very difficult

animal to trap, and many are the records of its dexterity in evading the most ingenious methods employed for its capture. Hunters therefore consider all means for destroying these animals sportsmanlike, and even poison them with meat or with the dead carcasses of animals into which strychnine has been inserted. To attract the prairie wolves to the poison laid for them the Mexicans employ that Eastern gum-resin *asafoetida*, the fetid odour of which will attract the coyote for miles, its alliaceous or garlic-like flavour, combined with its effluvium, being much liked by them. By such means thousands are caged annually, and as the fur is readily marketable, the above and any other methods are adopted to capture them.

The young are born in midsummer, five to ten forming a litter, and but for their destruction they would overrun the territory. Their bad name for howling habits accounts for their extirpation in America. The howling of a few of these wolves is most piercing and continuous, for the sustained and uninterrupted howl by one is joined on without break by another,

giving the impression that scores of these animals are congregated, whereas the tumult may be the work of only three or four wolves. Authenticated accounts conclusively show that these wolves hunt in packs, and feed greedily on all kinds of animal substances; they have been known to follow for days in the trail of travelling parties. If they cannot obtain animal food they will eat vegetables—in the autumn the fruit of the prickly-pear, and in the winter the berries of the evergreen juniper shrub. The prairie wolf is a very distinct and smaller species of *Canidæ* than the next described.

THE COMMON WOLF (*Canis lupus*) is a much larger animal than the Prairie Wolf, and although our text-books give the habitat of the Common Wolf as Europe, I am certainly of the opinion that the wolves found in Asia are of the same species. It must be considered that the influence of climate, the quality and condition of pasturage, the due supply and nature of the food, combined with environment generally, contribute towards the cultivation or degeneration of certain character-

istics, such as the length, thickness, and colour of the fur and the noticeable diversities of size. These differences have led naturalists to multiply the species, or supposed species, and name them after certain localities and other minor differences such as colour, but whether the wolf of Asia and the wolf of Europe are distinct species or merely local varieties should be settled by some one whose dictum would be accepted. I have studied the outward characteristics, and consider that several so called species should be classed under the one heading *Canis lupus*, or Common Wolf.

That wolves infested the British Isles is known to all, and their extirpation has been fully investigated by Mr. J. E. Harting in his work on "Extinct British Animals." To judge by the osteological remains which the researches of geologists have brought to light, there was perhaps scarcely a county in England or Wales in which, at one time or another, wolves did not abound, while in Scotland and Ireland they were still more numerous. Wolf-hunting was a favourite sport of the ancient Britons as



well as the Anglo-Saxons. In Athelstan's reign the wolves infested Yorkshire to such an extent that a retreat was built at Flixton, near Filey, by one Acehorn, wherein travellers might seek refuge if attacked by them. Great efforts were made by King Edgar to reduce the number of wolves, and a tribute of 300 skins was paid him during several years. Three hundreds of years after (the similarity of the numbers can only be a coincidence) Henry III. found the number of wolves sufficiently large to induce him to make grants of land to those who destroyed them. In Edward II.'s time the King's forest of the Peak, in Derbyshire, is especially mentioned as infested with wolves, and, contrary to the accepted opinions of early English historians, it was not until the reign of Henry VII. (1485-1509) that wolves became finally exterminated in England.

As might be supposed, the nature of the country in Scotland gave the wolf shelter for a much longer period. The well-known story of the last of the race being killed by Sir Ewen Cameron of Lochiel in 1680 is worth looking up by

those who desire full details. In Ireland the wolves made their last stand in 1766, but doubt is thrown upon this date, which is based upon the evidence of somewhat uncertain tradition.

THE INDIAN WOLF (*Canis palliper*), of which an illustration is given of the head, is confined to India south of the Himalayas. It is, according to authorities, distinguished from the common wolf by its smaller size and slighter build, and by its shorter fur, which has little or no woolly growth or under-fur. It is rare in Bengal, and is replaced by the common species to the west of the Indus. Sheep, goats, and antelopes are its chief food. It hunts in small packs of six or eight, and on occasions will attack adult human beings, for which purpose two or more will combine together; in certain districts a great number of children are carried off annually. Sir W. Elliot writes that he has seen a small pack in the South Mahratta country "steal round a herd of antelopes and conceal themselves on different sides till an opportunity of seizing one occurs, as the herd approaches, whilst grazing, to one or other



THE TASMANIAN WOLF.



of the hidden assailants. On one occasion these wolves were seen to chase a herd of gazelles across a ravine, in which two others were lying in wait. They succeeded in seizing a female gazelle, which was taken from them. Where there is no cover or concealment they scrape a hole in the earth, in which one of the pack lies down and remains hidden, while the others drive the herd of antelopes over him. Their chief prey is, however, sheep."

THE TASMANIAN WOLF (*Thylacinus cynocephalus*), as this animal is named in the Official List of Animals of the Geological Society, is not a wolf at all, nor a member of the *Canidæ* family; it belongs to the family *Dasyuridæ*, and is the only known existing species of its genus. Its true name is the Thylacine, and, though smaller than the common wolf, it is the largest predaceous marsupial (carrying young in a pouch like the kangaroo) at present living. It is now entirely confined to the island of Tasmania, where it is only found in the remote parts. The colonists used to call it "tigie," on account of the transverse black bands on the hinder part

of the back and loins. It is also called by the name of "wolf," owing to the havoc it commits among the sheepfolds, and by some it is less appropriately called "hyæna." It has become nearly exterminated on account of the losses by the farmers. It now confines itself to the rocky glens and caverns of the almost impenetrable mountainous regions of Tasmania.

The female produces four young at a time, which are placed in the pouch or marsupium formed by the folds of the skin of the abdomen, covering the mammary glands with their four nipples. In this pouch the young, measuring under an inch in length, are placed immediately they are born, in the manner explained in my notes concerning the Rufous-necked Wallaby (*q.v.*), where their growth and development proceeds. For some time after the young are able to run about and feed in the same manner as their mother they use the pouch for the purpose of shelter, concealment, or transport.

As we are considering some animals of the Australian regions, it is as well to include an animal which, although a native

of Australia, is not a marsupial, and, most remarkable to relate, is unique in this respect.

THE JACKAL

(*Canis variegatus*)

The variegated Jackal, found by Rüppell in Abyssinia, can no longer be considered as a distinct species, the discoverer himself having given up any claim to it being other than a variety of the North-African Jackal.

Mivart goes so far as to state "it is only with much doubt and hesitation that we provisionally separate the African Jackal from its Indian analogue." The species given as an illustration is to be found, in common with the others, in the heights of the districts of their habitat, though it makes its appearance in populous cities, where it takes up the place of the wolf, which is not so common.

Although the species of the wolf approaches very near to that of the dog, yet the jackal seems to be the dividing link between them: to the savage fierceness of the wolf it adds the impudent familiarity

of the dog. The jackal has been popularly called the lion's provider. The common notion that he is in confederacy with the lion for the chase of their mutual prey is but another traveller's story. The cry of the jackal is described by Mr. Blandford as consisting of two parts—a long wailing howl, three or four times repeated, each repetition in a note a little higher than the preceding, followed by a succession of (usually) three quick yelps, also repeated two or three times. It has also a very distinguishable cry when it finds itself in the vicinity of one of the large cat tribe. At the cry of the jackal, echoed, as it is, by hundreds of similar voices through the woods and arid plains, the lion, whose ear is dull, rouses himself to action.

The jackal is a useful scavenger, although it only clears off garbage, but it will steal a fowl or other small domestic animal. When outside the towns the jackal will eat any animal he can manage to subdue; though they may be met with singly or in pairs, they sometimes hunt in troops, especially at night.

THE VARIEGATED JACKAL.



THE DINGO.

THE FOX

(Canis fulvour)

The Fox above named is the one illustrated, and readers need not trouble about slight variations as being an emphatic indication, because many naturalists have been pleased to distinguish specimens of a different colour by a distinct scientific name, that these species are distinct. It is proved without doubt that the Red Fox and the Grey Fox are identical, as both varieties may be found in the same litter. The Animal Kingdom is divided into too many species, and but for the fact that the bulldog is a "domestic dog," and thereby ignored as unworthy of a scientific name other than *Canis familiaris* (common dog) by those who classify animals, it is quite possible and most probable that, under scientific naming, the brindle, white and fawn, and pied bulldogs, had they been "wild" animals, would be classed under a distinctive name, whereas all these varieties may be born in one litter, from parents which may not be the colour of any one of them.

One of the characteristics of the fox is the process above the bony projection forming the hinder portion of the socket of the eye, which is hollow. The pupil of the eye when contracted is elliptical, whereas in the other *Canidæ*, including the domestic dog, it is circular. The fox is so familiar to English readers, and the tales of its cunning so numerous and well known, that I will not take up space by narrating any. The Fennec Fox (illustrated) is also an African variety, characterised by the length of its ears, and is also called Asse Fox (*Canis chama*). It is essentially a desert animal, its coloration blending in complete harmony with the pale colour of the sand. At sunset the fennec leaves its burrow and makes for its drinking-place; after satisfying its thirst it seeks its food, which consists of small birds, lizards, jerboas, insects, or fruit.

The craftiness and cunning of the fox is legion. Our Lord called Herod Antipas "that fox": "Go ye and tell that fox, Behold, I cast out devils" (St. Luke xiii. 32).

Fox was the name given to the Old English broadsword, through mistaking for a fox a little dog used as a trade-mark by

the famous sword-maker, Julian del Rei of Toledo. The usual derivation is the Latin *falx*, French *fauchon*, our *falchion*.

"O Signieur Dew, thou diest on point of fox" (Shakespeare, "Henry V.," iv. 4).

THE DINGO

(*Canis dingo*)

This animal is particularly distinguished as being the only mammal not belonging to the group of marsupials (kangaroos, wombats, &c.) found in Australia. It is called the Australian Dog, but was in all probability an importation and not a true native. It approaches the shepherd's dog in appearance; the head is elongated, the forehead flat, and the ears short and erect or slightly inclined forward. The body is covered with hair of two kinds—the one woolly and grey, the other silky and of a deep yellow or fawn colour. It seldom barks or growls if irritated, but erects the hair of the whole body like bristles (after the manner of the hyæna) and becomes furious.

Many attempts have been made to extir-

minate this wild race of dogs, on account of the devastation a single dingo can make on a sheep farm, with the result that they are now to be found only in the interior. Sir John Seabright kept a dingo for about a year, and had it almost always in his room. He fed it with his own hands, and tried every means he could think of to reclaim the beast, but without effect. The animal never appeared to distinguish Sir John from any other person. It was insensible to caresses and would not follow him from one room to another.

Wolves and foxes have shown much more sociability, and the above instance seems to show that the propensities so marked in every breed of the domestic dog are lacking in the dingo, at all events in its natural state, although it must be confessed better results have been obtained in cases of the dingo bred in captivity.

WILD DOGS

THE CAPE HUNTING DOG (*Lycaon pictus*).—This exceedingly savage and forbidding creature has the distinction of being

THE CAPE HUNTING DOG.



THE STRIPED HYÆNA.

named after Lycaon, a King of Arcadia, said, in Greek legend, to have been turned into a wolf because he offered human sacrifice to Jupiter ; or, according to Ovid (Met. i. 163-239), because he tried to murder Jupiter, who was his guest.

This repulsive animal presents a remarkable resemblance to the hyæna, and its vernacular name is Hyæna Dog. It may be argued that it is not a descendant from the *Hyænida*, and that the external marking and other resemblances are merely superficial. It is true that the dentition is dog-like, yet it has been generically separated from the other *Canida*, probably on account of the absence of the fifth toe or thumb. The range of these pests is from the vicinity of the Cape through Eastern Africa to Kordofan. Its size is about that of the Dalmatian or "carriage" dog, and its coat is a yellowish grey, strangely marked (without any symmetry) with splashes of black. It goes in packs of about twenty and hunts down its prey in relays ; part of the pack will make the running, and when the leaders are tired they will fall back and the reserves will come in and relieve them.

Not content with making a meal off the sheep, they will rip open, tear, and mangle fifty more than they can devour. They never bark, but give utterance to a weird shrill shriek resembling ho—ho—ho—ho—ho, run one into the other.

In order to enable readers to compare the Cape Hunting Dog with the Hyæna, an illustration of this beast of prey is included, which latter, to the mind of the writer, is the most loathsome and disgusting mammal in the entire Animal Kingdom.

The hyæna was known to the ancients, who regarded it with superstition and awe. Its nocturnal habits include the grubbing up of corpses from graveyards, and it has also carried off children. Moore calls its cry a "moan," but others compare it to a sardonic laugh, whence the brute was named the "laughing hyæna." No description could give an adequate idea of this animal's deformed and unsymmetrical shape or its cruel fierceness. More savage and untamable than any other quadruped, its incessant growling and rage, accompanied with arched and bristling back, its head

THE FOX.



THE WILD RED DOG OF INDIA.



THE SIBERIAN SLEDGE DOG.



SIBERIAN WOLF.

INDIAN WOLF.

hanging low, combine to give this fiend a most frightful aspect, which is heightened by its wailing howl, such as might be emitted by some poor soul in purgatory. This cry of distress, we are told, has attracted the inquisitive steps of travellers, who become victims to this, the most repulsive of quadrupeds, whose ferocity is such that it has been known to fight with and conquer the "King of Beasts."

THE INDIAN WILD DOG (*Cyon dukhunenensis*).—This insignificant animal has the distinction of belonging to a separate genus under the name of *Cyon*, on account of having fewer molar teeth on each side of the lower jaw, so that the total number of teeth is forty instead of forty-two. It also possesses a comparatively short muzzle and its profile is slightly convex. Another great distinguishing point of difference is the possession of twelve or fourteen teats instead of the usual ten, and the presence of long hairs between the pads of the feet.

These exceedingly wild dogs are sometimes called Dholes or Red Dogs (as in Mr. Rudyard Kipling's vivid story), and are to be found throughout the forest-clad

portions of the Himalaya, from Kashmir to Assam and Eastern Tibet, and in the larger forests of India south of the Himalayas. Like the lynx, it adapts itself to the forest regions of the Himalayas, as well as the treeless districts of Tibet. These dogs are very fleet and good leapers, and prey both by night and day. Many of the larger deer and antelopes fall victims to these untamable beasts, and in marked contrast to the wild *Canidæ* (the wolf or jackal) it has been found absolutely impossible to render them tame in the slightest degree, which should be sufficient proof that they have nothing to do with the ancestry of the domesticated dog. Fortunately for the sportsmen of India the dhole is not common, or the jungle would soon be cleared of game, if not by annihilation, at least from the abandonment of their haunts by the deer and other game, so terrified are these timid creatures of these bloodthirsty dogs. They also prey upon wild swine, and have been known to pull down a buffalo, although these wild dogs are only about the size of a terrier.

THE TIBET DOG

(Canis familiaris var.)

When King George was Prince of Wales, in the course of his tour in India in 1905 and 1906 he arranged to visit the Native State of Nepal, and a most interesting collection of native animals was presented to his Royal Highness, many of which, illustrated by photographs and descriptive matter, appear in "Wild Animals and the Camera." Among that collection was a specimen of one of the, or may I say *the*, most ancient breeds of what naturalists, for want of a better description, are pleased to call *Canis familiaris var.*, or, in plain English, a variety of the domestic dog, which centuries ago attracted the attention of travellers by its size and ferocity. The scarcity of this animal can be judged by the fact that really large adult specimens are rarely seen out of their native country. Many long residents in India have never seen this dog at all, and some few have only seen third or fourth-rate specimens.

The specimen that arrived in June, 1906,

disappointed all dog fanciers who went to see the Tibetan Mastiff, that magnificent dog which our great travellers have elevated to the highest rank as the grandest all-round guard of any dog in the world, remarkable for its strength and ferocity, points which are needed in an animal which has to guard the sheep and the cattle from the ravages of wolves, leopards, and other four-footed marauders, and protect the camps from robbers when women only are left in charge.

The specimen above referred to had been "clipped" in Calcutta, with a view of enabling it to withstand the heat of the journey, which it did fairly well. The red tape of quarantine regulations required this scarce animal to be isolated and kept in one spot, and the twenty feet of ground facing south allotted to the animal, with the blazing sun of hot summer playing upon its kennel, resulted in its death a few weeks after arrival. This specimen gave the impression of being a short-coated retriever, and was not recognisable as the Tibet dog, either by appearance or disposition. The unsuitable quarters in which



it was housed, following on a long sea voyage in a cage of small dimensions, had taken all the courage out of the poor beast, which very soon succumbed to the environment of unsuitable housing.

The typical specimen, which forms part of King George's collection which arrived in the latter part of the spring of 1912, shows all the outward points described by Eastern travellers, and the ferocious disposition for which the dog of Tibet is notorious. A careful examination of the photograph reproduced will convey to the reader the general appearance of this faithful guard, historically celebrated, and in the opinion of the writer the best specimen seen in Europe. I am of the opinion that this scarce animal is exposed to too much direct sunlight, and that the sandy gravel with which his kennel run is covered is a mistake, as the sharp grit must become attached to the meat which is thrown to him and swallowed. There is nothing so good for dogs as a well-drained concrete floor plus a grass run for exercise. I am sure no breeder of dogs he expected to keep any length of time would advocate a

kennel on the lines of the one in which the most valuable and scarcest specimen of the domestic dog is housed, considering that the Tibet Dog is used to the eternal snow of the Himalayas. I shall be pleased to acknowledge I am wrong. The late King Edward VII., when Prince of Wales, brought a specimen of the Tibet dog from India in the seventies, which was also an excellent specimen and was named "Siring."

THE DOMESTIC DOG

(*Canis familiaris*)

As these animals find place in the family *Canidae*, a short description of the breed for which England is famous all over the world should not be out of place in a volume whose title suggests wild animals only. Having bred many celebrated prize-winning bulldogs, preference is given to this, the national breed, the emblem of courage, strength, and endurance, without the disadvantage of aggressive pugnaciousness. "I shouldn't like to meet him in the dark!" "What an ugly beast!" and

other such expressions have fallen on the ear of every man who ever kept a bulldog. Exclamations of terror and absolute fright by persons encountering a typical specimen are common, whereas those who know the grand disposition of the breed will stop and admire, and often caress, the most formidable-looking example of the national breed. Many, or I may say the majority of people unacquainted with the bulldog, have the opinion that this particular breed is the incarnation of unreasoning savageness, treachery, and vice. So implanted is this supposition that a notice "Beware of the Bulldog" fixed on the side door of the garden leading up to the house of a friend of mine who only kept birds was sufficient to deter tramps or hawkers from even opening the door.

How this impression was first made can be judged by a short investigation of the history of the bulldog, why he was bred and the uses to which he was put, which, as his name implied, was the baiting of the bull, in which the bulldog displayed the most extraordinary courage, determination, and tenacity, such as has no parallel in the

entire Animal Kingdom. There are many who assert that the present-day bulldog does not possess the same characteristics as the type of dog shown in the old prints of "Crib and Rosa," "Ball," and "Lucy," &c. I do not agree with this statement, for I have witnessed all the propensities attributed to the bulldogs above referred to exhibited in twentieth-century dogs. It must not be forgotten that the dogs for bull-baiting have happily ceased to exist for very many decades, and the purpose for which the bulldog was originally bred is not one of the propensities that breeders of the last thirty or forty years have desired to perpetuate. The dogs immortalised by the prints and accounts in the early nineteenth century were trained for their mordacious work from puppyhood, and set on to kill dogs whose teeth had been drawn or broken off, or cats whose claws had been cut off—in fact, no brutality was too cruel in the days when dog and cock-fighting were recognised sports in England, and the Westminster pit, which was patronised by the nobility, was in the height of popularity.

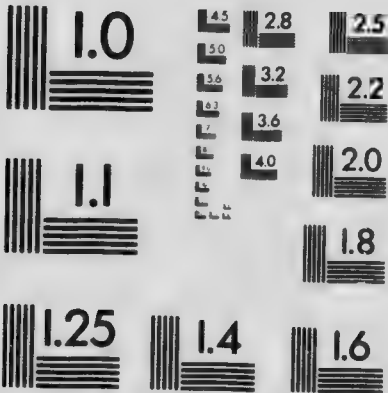
THE ENGLISH BULL DOG.
(*Luna de Gey*)



THE HAIRLESS DOG OF MEXICO.



(ANSI and ISO TEST CHART No. 2)



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In the "Sports of England" we read of the "Eastern fierce hunts when foaming boars fought for their heads, and lusty bulls and huge bears were baited with dogs." Near the *Clink*¹ was the Paris or Bear Garden, so celebrated in the time of Elizabeth for the exhibition of bear-baiting, which was then a fashionable amusement. A Bill to abolish bull-baiting was thrown out of the Commons in 1802, and it was not until 1835 that this cruel and disgusting sport was made illegal. Bull-baiting will be little more than a name to most of my readers, and those who wish to read the best account of the bulldog and glance at the reproductions of the best of the old prints, celebrated prize-winners and their owners, and many other most interesting illustrations, should consult a copy of "The Bulldog," by Edgar Farman, which, however, is quite out of print, or "Bulldogs and Bulldog Men," by H. St. John Cooper.

I refrain from repeating any of the

¹ A prison which was situate at one end of Bankside, London. It belonged to the "Liberty of the Clink," and was burned down in the riots of 1780.

harrowing records of the pluck and endurance of the bulldog in baiting and fighting days; we can, however, by the short reference I have made to the "sport," see the reason for developing what I should call the four great distinguishing points of a bulldog outside of the general appearance, which stands first and foremost, in the following order of merits: The nose should be deeply set back, almost between the eyes, broad and black, and the nostrils large and wide apart in order that the dog can breathe freely while holding on to the bull. The front legs should be very stout and strong in bone, muscular and straight, set well apart, so that the dog has a better chance of landing on his feet and remaining there. He should be short in the back and abnormally thick, deep, and strong in the neck, which might otherwise be broken by the tossing of the bull—for, being comparatively narrow at the loins, he would be tossed up in one piece, and there being little weight behind, the tremendous jerk of the violent lever-like action of tossing is minimised. The powerful and wide "turn-up" of the underjaw enables him

to get a good grip and retain it. These salient points and many show points are well defined in the illustration of "Luna de Lex," one of the most successful prize-winners at the classical shows, and the kindest and most faithful bulldog I ever bred, weighing about forty pounds. Unlike other dogs, the bulldog attacks without uttering a sound, and will bear any amount of punishment from his assailant, or those who try to beat him off, in silence; he invariably goes for the head, and will not let go until he is killed or made insensible by strangulation, or partly asphyxiated by strong ammonia. An utter disregard of pain, undaunted pluck, combined with a tenacious instinct, still remain in specimens of to-day as a natural characteristic without any training, and are invariably exhibited when the dog is attacked in earnest by another dog, or when he is protecting his master.

A really savage domestic dog of any breed, large or small, showing a pugnacious or treacherous nature had better be destroyed before a judge's order compels its owner to pay damages and make away

with the animal. I could mention many breeds which are not trustworthy, and one has only to visit a representative dog show to form an opinion as to whether the bulldog in general is other than a most docile and affectionate creature, and the one which I would trust before any other breed with children; those people who have no sympathy with dogs, and particularly dislike bulldogs, are not reliable arbiters, and should not prejudice others against a race by ventilating unauthenticated stories, and thereby interfere with the pleasure enjoyed by those who love to have dogs around them. Once a man has kept a bulldog he will confess there are few among the numerous varieties of domestic dogs that approach, as a pal and companion, a thoroughbred specimen of the national breed of England.

THE SIBERIAN SLEDGE DOG.—The Arctic dogs, whether Siberian, American, or Kam chatkan, very closely resemble each other in size, shape, coat, and general character, the only difference being one of colour. These dogs are the most wolf-like in appearance of all the domestic breeds,

and are commonly called the Eskimo Dog. Their small upright ears, long and pointed muzzles and rough coats, combined with their general build and their inability to bark, has led travellers actually to mistake a pack of them for wolves. When the Antarctic Expedition was being organised by Commander R. F. Scott, two packs of trained sledge dogs were sent over to England *en route* to Australia, where they would be picked up by the *Discovery*. The reason for first sending them to England was in order that they might be sent out in a "mutton boat," which enabled them to be kept cool and thereby acclimatised them to the intense cold they would have to endure in the Antarctic regions around the South Pole. This was no doubt a wise precaution, as a journey in an ordinary steamer passing through the Red Sea would have been very risky.

Sledge dogs are trained for their work as soon as they can walk, and being tied up, soon acquire the habit of pulling, in their attempt to recover their liberty or to roam in quest of their mother. When about two months old they are put into the

sledge with grown dogs, and sometimes eight or ten little ones are under the charge of some steady old animal. Every dog is distinguished by a particular name, and the angry repetition of it has an effect as instantaneous as an application of the whip. When the sledge is stopped they are all taught to lie down, and they will remain in this position for hours until their master returns to them.

Captain Lyon, who had so many opportunities of studying the habits of these dogs, asserts that cold has very little effect upon them; for although the dogs at the huts slept within the snow passages, his slept without any shelter alongside the ship. These dogs were of inestimable service to their masters in discovering by their scent the winter retreats which the bears make under the snow. Their endurance never tires, and their devotion to their master is never shaken by blows or starving. They are most obedient, and, with the exception of their disposition to fight one with the other give very little trouble. Like the chow, they are strongly attached to the one being they look upon as their

master, and an angry word will, in nearly every instance, except during a fight, bring them to absolute subjection. This strong love for their master is a peculiar characteristic, and however kind others may be towards them, they never can gain their affection, either by coaxing with food or otherwise, and whenever set at liberty they rush towards the spot where the individual of their attachment is.

It should be observed that there is one great point in the sledge dog, which is its strong resemblance to the wolf. It will be seen, however, that it differs materially in the carriage of the tail, which is pendulous in the wolf and other wild animals; but, as will be noticed in the photograph, the sledge dog carries its tail curled over the back.

THE HAIRLESS DOG OF MEXICO.—This weird-looking specimen of a dog is not only found in Mexico, but also in China and Japan. Those found in the latter countries have a crest or top-knot, while others have transferred these hairs to the tip of the tail; in all other respects they are perfectly hairless. They have been shown as a freak

dog, and quite a large sum was amassed by an itinerant showman with his "India Rubber Dog." The skin of these peculiar dogs is exceedingly elastic to the touch, and being as black as ink, except for the spots, which are white, gave the showman the idea of the name, and in the showman's business a good name is everything. The width the legs are apart is undoubtedly the result of rickets, which it is a pity to see is becoming prevalent in bulldogs, especially the light-weight specimens which by some are called "Miniature bulldogs." The dentition of the hairless dog is very curious, only one molar tooth being possessed on each side of the mouth, plus the incisors and canines. Mrs. H. G. Brooke has successfully bred specimens in England. Her "Paderewski Junior" and his sire, the "Hairy King" (droll names for hairless dogs), both won prizes at shows.

WILD CATS

(*Family Felidæ*)

Having given a number of illustrations of the larger wild cats in "Wild Animals

and the Camera," including the lion, tiger, leopard, jaguar, cheetah, and lynx, with a lengthy description of each animal, it will interest readers generally to include now some of the smaller wild cats, which, by their size and general appearance, approach nearest to the domestic cat. Another reason for the inclusion of cats in this volume is the recurrence to my memory that it was at the suggestion of my friend Mr. Louis Wain, that inimitable portrayer of cats, that I was induced to produce "Wild Animals and the Camera." Any one who has taken an interest in cats must have observed the skilful freedom of line employed by Mr. Wain in combining expression as well as technique in his cat studies, and those who have the pleasure of conversing with this artist on any point bearing upon the small cats cannot but have observed his enthusiasm for "poor pussy." One of the most original ideas in this respect was his invitation to all the catsmeat men of London to a dinner given at the City of New York Hotel, at which over two hundred purveyors of horseflesh sat down to dinner and were entertained

by some of the leading stars of the legitimate and variety stage. I well remember the event, as I photographed the president's table, and it was none other than her Grace the Duchess of Bedford who presided over this feast.

Digressing from the head of this section, and considering for a few minutes the relation of the domestic cat to its origin, there can be no question that the ancestral stock from which the domesticated cat of Europe originated was the wild caffra cat of the Egyptians. It has, however, been suggested by that great authority, Mr. Blythe, that there has been, at least in many districts, a large amount of subsequent crossing of the original domestic breed with the wild cat. It is also suggested that the domesticated cats of India may have had a totally distinctive origin from those of Europe, and there are many reasons in favour of the belief that either the desert cat or the waved cat (if either of these be a truly wild species) may have been the original parent stock from which they were derived.

Common in India, though seen only on very rare occasions in Europe, is the spotted

domestic cat, which strengthens the belief in its origin from one or more of the spotted wild species now inhabiting that country; whereas the prevalence of "tabbies" in Europe points towards the caffra cat as its origin. One thing must make itself clear to all minds, without going deeply into the origin of domestic cats, and that is, that all those in Europe and Asia have not descended from one and the same parent stock.

It is obvious that the present lowly state of the domestic cat is the outcome of the fact that the race has become so unclassified and so numerous as to be no longer valuable, for in bygone ages not only were they greatly appreciated and properly cared for in Egypt, where, as all the world knows, temples were erected in their honour, but they were treated with reverence and affection. It is also recorded that in the time of one of the early Princes of Wales "cats were of considerable value." The Moham-medans were equally attached to the cat: obviously because of their Prophet's great love for this animal. It is well known that he preferred cutting off the sleeve of his

robe to disturbing the repose of his pet, that had curled herself (it was always she) comfortably on that voluminous portion of his attire. In the time of this prophet, cats were allowed to enter the mosques, and were caressed there as Mohammed's favourite animal, while the dog that should dare to appear there would pollute the place with his presence, and would be punished with instant death; but as time went on, cats increased and multiplied to such an extent that they have been ruthlessly condemned, and their extirpation demanded, or at least a tax put upon their heads. Except in the minds of old maids and venerable bachelors they appear to have gone out of favour, but those who have the time to study their amiable characters will learn what delightful companions they can be when properly treated and understood.

As observed in the article on the *Canidae* domestication has not produced the many differences in breeds and race in cats as among dogs, and there are no such contrasts as exist between the St. Bernard and the fox terrier. It has, however, been found

THE INDIAN CIVET CAT.



THE INDIAN JUNGLE OR FISHING CAT.



that quite common cats produce one or two exceptionally fine and beautiful kittens in a litter among four or five quite hideous brothers and sisters, as the following observation by Mr. J. E. Panton, in his "In Defence of the Cat," confirms: "When we moved to our present abode, we found in the stables one of the plainest and hungriest cats it has ever been our misfortune to see: we did not like or want her, but we cannot be unkind to any creature, and in consequence we fed and entertained her, and to our astonishment our own cats were quite civil to her. When she had been our property for some time, we were led to believe that she had taken advantage of our hospitality and had foisted a family upon us; but nowhere could the family be found, and we were beginning to think we had suspected her wrongfully, when one morning on the front door step we found, apparently alone and unattended, the most beautiful red and white long-haired kitten of quite six weeks old that we had ever seen. We brought it in, and fed it, made much of it, welcomed the beauty in every way and wondered to whom it belonged,

made all inquiries, without any result, and after two days we named it and introduced it properly to the rest of the family; and then on the third morning we were astonished to find a second kitten, equally beautiful, equally long-haired, but this time owned and obviously chaperoned by the stable cat, who as obviously had introduced number one tentatively and to see what we should do, and then produced number two, believing by the reception given to number one that we should not resent her family as much as she feared we should do. But the matter did not end here, for although the stable cat now stayed indoors, and seemed quite happy with her beautiful children, we were attracted by the sound of mewing to an arbour covered thickly with twigs, and just like birds in a nest we discovered two more kittens; but these were just as ugly as their mother and had evidently been forgotten by her in her pride and joy at our hearty reception of the beauties—or could she have subtly argued to herself that she would introduce the lovely sisters first, and then would have brought forward the others?"

If space allowed we could tell anecdotes of Thomas, the white cat who lived to the honoured age of twenty-one, who went to bed every night in his life in a basket with a couple of blankets, and Tom would not sleep in them if they were the least soiled or dirty, and he would literally scream with rage if his mistress went upstairs without first putting him to bed like a child, and finally, when he found he was dying, dragged his poor old limbs quite a mile away to the stable of a friend to save his mistress the anguish of watching his last moments.

THE INDIAN DESERT CAT

(*Felis ornato*)

This wild cat is also, as implied by its name, an inhabitant of the open regions, thereby differing from the spotted-leopard cat (*Felis Bengalensis*) which is exclusively a forest-dwelling species, inhabiting many parts of India, such as the Outer Himalayas. To all appearances it is a quiet and pretty little cat, not quite as large as our domesticated cat. In spite of its small size and

amiable appearance, the leopard cat is a most ferocious and spiteful animal, and carries out its depredations with exceeding boldness—General McMaster stating that he saw one carry off a fowl nearly as large as itself, shaking it savagely meanwhile, and making a successful retreat, in spite of the abuse, uproar, and the missiles which were hurled at the thief.

The Jungle Cat (*Felis chaus*) does not appear to be any more amiable than the one above described, and it was with a great expenditure of patience that the photograph reproduced was obtained. At the mere approach to its cage it "flew" at the bars, spitting and snorting with every sign of vindictiveness, yet the photographic result gives the impression of a docile animal. The jungle cat is rarely seen, it being of nocturnal habits, but Dr. Jordan describes it as frequenting "alike jungle and the open country, and very partial to long grass and reeds, sugar-cane fields, corn fields, &c. It does much damage to game of all kinds, hares, partridges, &c., and once I shot a pea-fowl at the edge of a sugar-cane field, when one of these cats

THE TIGRINE WILD CAT.



THE ZAMBESI WILD CAT.



THE FETTERED WILD CAT.



ran out, seized the pea-fowl, and after a short struggle (for the bird was not dead) carried it off before my astonished eyes, and in spite of my running up towards him, made good his escape with his booty."

The Fishing Cat (*Felis viverrina*) is another of the spotted cats of India, with a circular pupil to the eye, and derives its name from its peculiar habit of living to a great extent upon fish, which it captures for itself. This cat is a most important member of the family, since it connects the more typical cats so closely with the lynxes, to the extent that it is impossible to refer the latter (as has been often proposed) to a distinct species. It is somewhat larger in size than the domestic cat, from which it also differs in having a circular pupil to the eye, thereby agreeing with the lynxes, and also approximates to the latter in having a few long hairs on the tip of the ears.

The Fettered Cat (*Felis caffra* or *maniculata*) is considered the parent stock from which the domestic cat of Europe is descended. It is therefore of more than usual interest, and is frequently termed the Egyptian cat. It is about the size of a

large domestic cat, and is generally of a yellowish-brown colour, darker on the back and paler on the under part. Differing from the cats previously described, it is marked with faint pale stripes which verge into the "tabby" markings on the limbs. Its tail is approximately the same proportional length as that of the domestic cat, more or less distinctly ringed towards its tip, which is completely black, and the sides of the face are prominently marked by two horizontal streaks.

The caffra cat has a very wide range of distribution, being common throughout Africa from the Cape to Algeria and Egypt, and also extending into South-Western Asia. In times past it also ranged into South-Eastern Europe, its fossilised remains having been obtained from the Rock of Gibraltar, which indicates that at one time Spain was connected by land with Africa.

Dr. A. Nehring, of Berlin, whose opinion is entitled to considerable weight, considers that the black soles of the hind feet, common in the caffra cat and the domestic cat of Europe, is indicative of the de-

scent of the latter from the former, although it is quite probable that there may be also a strain of Asiatic blood in our cats, and much the same impression is entertained by Professor Mivart.

Darwin, however, does not consider that the origin of the domestic cat can be determined with certainty, but concludes by remarking that whether domestic cats have descended from several distinct species or have only been modified by occasional crosses, their fertility, so far as is known, is unimpaired.

The taming of the fethered cat, which is identical with the Egyptian cat or caffra cat, was thoroughly mastered by the ancient Egyptians. This is undoubtedly demonstrated by a painting in the British Museum representing a hunting scene. Commenting upon this picture Mr. P. H. Goss observes that it appears to have been the custom for the fowler to enter upon such expeditions accompanied by some of the female members of his family, "embarking on board a boat, with a few decoy birds and a trained cat, they proceeded to such parts of the river as were

fringed with dense masses of the tall papyrus-reed. Waterfowl of various species swarmed in these rushy covers, and by the numbers of nests with eggs and young usually represented, we are doubtless to infer that the possession of this sort of stock was no less desired than that of the birds themselves. The cat, strange as it appears, was certainly taught to seize upon the bird; in the picture she has just caught one in her mouth, while she holds another with her two fore paws and a third between her hind paws. It is probable also that, the repugnance of this animal to wet her feet having been overcome by training, she was accustomed to fetch such birds as fell into the water." In a footnote, Mr. Goss adds that it is interesting to find the cat domesticated at so early a period.

The diminutive black-footed cat which forms the centre picture of the plate hails from that part of Africa through which the Zambesi River flows, and is named the Zambesi Cat. If appearances could be considered as an indication of character or disposition, one would feel inclined to approach this plump, kittenish-looking cat without fear.

but the indiscretion would leave its mark, for a more savage little beast than this innocent-looking creature it would be difficult to find. This is another of the African "tabby" marked cats, which being black-footed is in all probability one of the progenitors of the domestic cat of Europe.

The South American Tigrine Cat (*Felis Tigrina*) is indeed a most formidable-looking creature, with large, round-pupiled eyes that pierce through the gloom and seem to flash with a phosphorescent glow that would transfix with terror the poor birds upon which it preys. This, again, is of the spotted kind, the "rosettes" being similar to those which distinguish the "spots" on the American jaguar from those on the Indian leopard.

The Indian Civet Cat (*Viverra zibetha*) is one of the larger members of the genus, and although it is named "cat" is not classed as one, although it exhibits the nearest affinity to that family. The true civets, of which the one illustrated is a typical specimen, differ considerably in the distribution and number of their teeth. They have a larger number of cheek teeth than

any of the existing cats, and the total number is forty; the flesh teeth are like those of the dog, and thus different from those of the cats. The civets are further characterised by their long flattened bodies, narrow and elongated heads, small and rounded feet, each furnished with five toes, of which the claws are only partially retractile, and the hairy soles of the feet are without pads. It is stated on the authority of those who have lived in India that this civet is generally a solitary animal, and that it hides in woods, bushes, and thick grass during the day, wandering into open country and often coming about houses at night. Not infrequently civets are found in holes, but whether these are dug by them is doubtful. It is said to be very destructive, killing any kind of small mammals it can capture and also feeding on snakes, frogs, insects, eggs, fruits, and some roots. Unlike the cats, civets take readily to water, and the young are born with their eyes open. Should hounds or other dogs come across the trail of a civet, they will leave that of any other animal they may be pursuing and follow this trail.

THE MAN-EATING TIGER OF INDIA

(Felis Tigris)

The shocking mortality in India caused by wild animals is almost incredible, the tiger alone being responsible for the greater number, which, sad to relate, has nearly reached a total of 1,000 deaths per year, to say nothing of terrible wounds inflicted upon those who have had the misfortune to come within the reach of a man-eater, a good example of which forms the end papers to this volume. It appears almost incredible that 24,887 human beings suffered a terrible death in India alone during 1910 through the ravages of wild animals or the bite of poisonous snakes. There is, however, no doubt as to the accuracy of the numbers given, the statement just published by the Home Department of the Government of India quoting the following figures :—

In 1910 the total number of persons killed outright by wild animals was 2,400, which shows a diminution of only 96 on the number killed in 1909. The

man-eating tigers were alone responsible for the death of no less than 853 persons in 1910, and were particularly aggressive in the Sundarbans — that impenetrable jungle and marshland on the coast of the Ganges delta. The ravages of the man-eaters in the Khulna district are attributed to the scarcity of their natural food supply, considerable numbers of deer having been swept away by the great storm wave which visited this part of India during the cyclone of 1909.

THE LEOPARD

(*Felis pardus*)

The Leopard illustrated is a most typical specimen of this, the third in size of the Old World cats, and distinguished by its coloration and beautiful markings, formed by spots or rosettes, which are somewhat smaller, though similar to those of the New World jaguar. The leopard was responsible for no less than 351 deaths in India in 1910, and 462 in 1909. The illustration is of his Majesty the King's specimen, which arrived in

G.M. KING GEORGE'S LEOPARD.



THE BABY INDIAN ELEPHANT.

England this (1912) summer, and exhibits great ferocity.

Wild pigs were an absolute terror to the natives of Eastern Bengal and Assam during 1909, killing outright no less a number than 120 persons. These figures were happily not maintained during 1910, the victims of these unclean beasts decreasing to 50. Another thankful diminution in the number of deaths by the man-eating tiger during 1910 was in the Central Provinces and Berar. The victims were considerably less compared with 102 in 1909. This may in some degree be accounted for by the fact that six notorious man-eating tigers and two leopards which had been creating great havoc in the district were killed. Large sums of money are offered annually by the Government of India in order to prevent this terrible loss of life, and last year the amount was considerably increased, rewards amounting to Rs. 144,289 being paid to those who killed the destructive wild animals. Deaths in India by snake bites in 1910 exceeded the mortality in 1909 by 1,123, and were

2,749 in excess of the fatal cases recorded in 1908. The actual number of human beings who were fatally bitten by snakes during 1910 reached the enormous total of 22,487, which is remarkable, considering the fact that 91,104 snakes were killed in that year, and rewards amounting to Rs. 2,875 were paid.

The floods in 1910 are accredited as having driven the snakes to seek refuge in the raised village sites of East Bengal and Assam, where the mortality from snake bites increased. A considerable number of cases were treated in the last-mentioned provinces and the United Provinces with the Burton lancet and permanganate of potash, and it is recorded that a high proportion of the patients recovered. The great difficulty of proving that the cases successfully treated with the lancet were bites by really poisonous snakes unfortunately throws some doubt on the reliability of this treatment.

In addition to the great sacrifice of human lives, an enormous amount of money is lost annually by the destruction of cattle by wild animals. The wholesale

slaughter during 1910 amounted to no less than 93,074 head of cattle, whereas in 1909 the numbers slain were even greater, totalling 94,207.

The following table gives the numbers of persons killed by wild animals and snakes during the three years 1908-1910.

	1910.	1909.	1908.
Hyenas	25	57	37
Wild p	50	120	—
Elephants	55	63	53
Bears	109	96	100
Wolves	319	256	269
Leopards... ..	351	462	302
Tigers	853	896	909
Other animals	638	546	* 469
Snakes	22,487	21,364	19,738
	24,887	23,860	21,877

* Including wild pigs.

THE ANTELOPES

Naturalists do not divide all the ruminating mammals with hollow horns (in contradistinction to the deer, all of which have solid horns) into a variety of groups.

With the exception of the sheep, oxen, goats, and the curious prong-buck of America, these ungulates are called Antelopes, which zoologically, in many respects, come very closely to the goats. One most important distinction must always be remembered in classing an animal among the antelopes, and that is the curious fact that the horns of antelopes are permanent, whereas those of the deer are renewed periodically. There are more than a hundred species of antelopes, most of which are confined to Africa and Arabia; some, however, of the smaller forms, such as the gazelle, which rank among the antelopes, come from Asia. The gland beneath the eye also distinguishes the antelopes from the oxen. For the purposes of this work only seven species are here illustrated and dealt with.

THE ELAND

(*Taurotragus oryx*)

The Eland is a native of South Africa and the largest of all the antelopes. The specimen herein reproduced stands about



19 hands high at the withers, and weighs close on 1,600 lb. One peculiarity of the horns of this antelope is the spirally twisted form, and, with the sole exception of the eland, the carrying of horns by antelopes is restricted to the males. The flesh of the eland is most highly esteemed as food, and its hide is much valued; in consequence, its natural range is rapidly diminishing. In fact, the eland is now rarely seen in Cape Colony, and unless some preserves are set apart for this animal in East Africa, the advance of civilisation is likely to prove fatal, and its complete extermination is probably merely a question of time. The excessive development of the dewlap, which is sometimes furnished with a partial throat-mane of coarse hair, is well defined in the photograph.

Although elands have been successfully bred in confinement in the parks of many private owners in England, no commercial success has been achieved with the many attempts to acclimatise this fine beast in this country, although it requires little more protection or care than that given

to the finer breeds of cattle. When it is considered that specimens have been known to turn the scale at 2,000 lb., it is remarkable that no one has attempted to take up the marketing of the eland as a commercial enterprise in England.

THE SPRINGBOK

(*Gazella euchore*)

This South African antelope, called the Springer antelope, or Springbuck, is, like the gazelle described above, one of the beautiful species of the genus. Its name as shown in the title was given it by the Dutch colonists, on account of the bounding leaps which it takes; Pronkbok (showy or beautiful buck) was also applied by reason of the colours which it discloses when leaping. The latter effect is caused by two folds of the skin, which, ascending from the root of the tail and terminating upon the croup, dilate when the animal is bounding and expose a large triangular space, otherwise concealed, covered with white hair, edged by two dark streaks. The head of the animal is rather short, with



THE ELAND.

somewhat of the expression of the lamb. The neck is slender, the body comparatively bulky, and the legs slender and elegantly turned. It is larger than the true gazelle, but of the same make and colour.

Colonel Hamilton Smith's description of the springbok is vivid and interesting. "It resides," he tells us, "on the plains of South Africa, to an unknown distance in the interior, in flocks assembling in vast herds, and migrating from north to south and back with the monsoons. These migrations, which are said to take place in their most numerous form only at intervals of several years, appear to come from the north-east and in masses of many thousands, devouring like locusts every green herb. The foremost of these vast columns are fat, and the rear exceedingly lean, while the direction continues one way; but with the change of the monsoon, when they return towards the north, the rear become the leaders, fattening in their turn, and leaving the others to starve and to be devoured by the numerous enemies who follow in their march. At all times when impelled by fear, either of the hunter or

the beasts of prey darting among the flock, but principally when the herds are assembled in countless multitudes, so that an alarm cannot spread rapidly and open the means of the flight, they are pressed against each other, and their anxiety to escape impels them to bound up in the air, showing at the same time the white spot on the croup, which is dilated by the effort of springing, closing again in their descent, and producing the beautiful effect from which they have obtained the name of Springer- and Showy-bok.

THE INDIAN GAZELLE

(*Gazella bennetti*)

As the prefix to this gazelle denotes, the habitat of this animal, the most graceful and delicately built in the Animal Kingdom, is Asia. The Gazelles are characteristically a distinct group of Antelopes; the muzzle is invariably hairy in the true gazelle (*i.e.*, there is no wet, naked nose and muzzle); the horns are curved backwards, and towards the tips are bent

slightly forwards, and form a lyre-shaped arrangement. There are about twenty-four different species distributed from Western China and Tibet across India, Persia, Syria, and Arabia to North Africa, and thence over all parts of the continent except the forested regions, which the true gazelle seems to abhor. The majority of gazelles do not exceed thirty inches in height. They resemble both the goat and the deer in their natures. Like the goat, they have hollow horns, which they never shed, which is contrary to the deer. They have a gall-bladder, which is found in the goat and not in the deer, and, like the latter animal, they feed rather upon shrubs than grassy pastures. They seem, therefore, to be a *juste milieu* between the goat and the deer; or to be correct, they form a distinct kind by themselves.

Of all animals in the world, the gazelle has the most beautiful eye, extremely brilliant, and yet so meek that all the Eastern poets compare the eyes of their mistresses to those of this animal. Moore, in his "Lalla Rookh," took advantage of the fine eyes of the gazelle :—

"Oh, ever thus, from childhood's hour,
I've seen my fondest hopes decay ;
I never loved a tree or flower,
But 'twas the first to fade away.
I never nursed a young gazelle,
To glad me with its soft black eye,
But when it came to know me well,
And love me, it was sure to die."

THE CHAMOIS

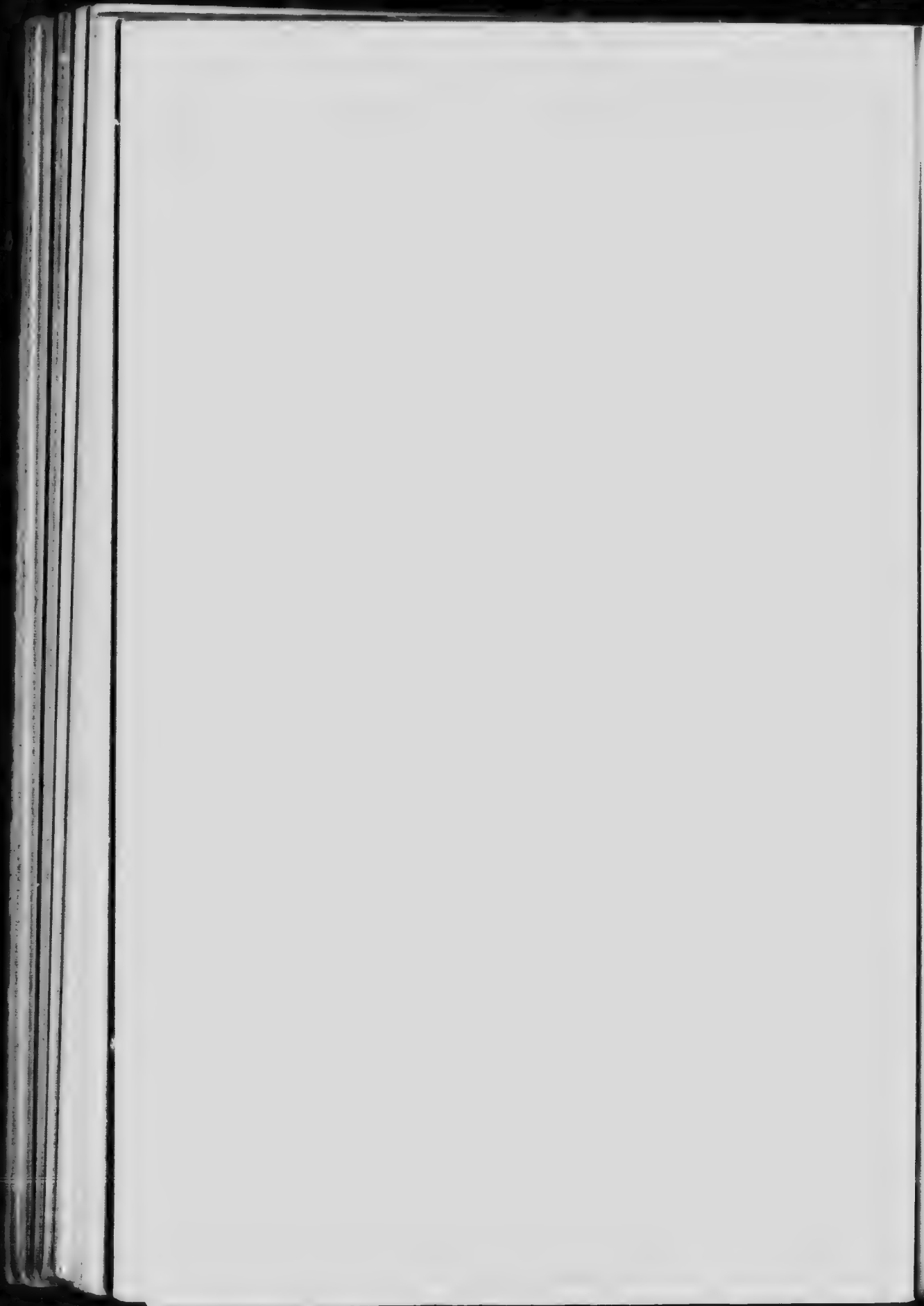
(*Rupicapra tragus*)

The Chamois, though a wild animal, may be easily tamed, when it becomes perfectly docile. It is only to be found in rocky and mountainous places and is of a most active and lively disposition, its agility being beyond expression. In the elevated districts of the Alps, as well as the Pyrenees, the chamois dwells in small herds, cropping the herbage of the mountain-sides. In size it may be compared to a large goat ; its colour is a dark chestnut-brown, with the exception of the forehead, the sides of the lower jaw, and the muzzle, which are white. Its horns, rising just above the eyes, are black, smooth, and straight for about two-thirds of their length, when they suddenly curve backwards. Its hoofs are

THE CHAMOIS



THE SPRINGBOK.



admirably adapted to avail themselves of any little roughness or projection, either of the naked granite or the icy glacier, and its hair is thick, long, and coarse, serving not only as a defence against cold, but as a provision against the bruises to which the chamois is constantly liable.

Schiller described Werni as saying—

“Beasts have reason, too,
And that we know, we men that hunt the chamois;
They never turn to feed—sagacious creatures!—
Till they have placed a sentinel ahead,
Who pricks his ears whenever we approach,
And gives alarm with clear and piercing pipe.”

This is not merely poetry, but fact. Only let man or beast of prey appear and the sentry that has been chosen from the herd makes a loud hissing noise as a warning of danger; the herd now gaze intently, as if to see for themselves if there is really peril, and when they are satisfied of this they bound from ledge to ledge, where the human eye can mark no footing—spring from crag to crag, clearing the crevasse, sweep over the glaciers, even throw themselves down the precipice and find safety where death would seem to be inevitable.

Provided with gun, a bag of provisions, an iron-shod staff to assist in climbing and leaping, an axe to cut steps in the towering parapets of ice, and shoes studded with iron points, the chamois-hunter traverses the mountains and prowls warily for his prey, not only during the day, but the night also. Wherever the chamois flees he follows. A hunter, for instance, had been for some days endeavouring to discover the haunt of a chamois, and at length he saw two young ones sporting round their mother in a niche on top of a high rock, while she was glancing warily down the valley to watch for any hostile approach. To avoid being seen he made a great circuit and so reached a path which led to the spot. Exactly in front of the niche the rocks descended perpendicularly to an immense depth. At the back was another steep descent. Some fragments of rocks formed a kind of bridge between the large masses, but these were placed too high to be accessible to the little ones and could only be available to the mother. Escape, therefore, seemed impossible. Yet no sooner did she catch a glimpse of the

hunter than she sprang on him with all the fury with which maternal love can fire the most timid creatures. As the hunter's hands were employed in keeping himself to the narrow path, he warded off the blows of the chamois as well as he could with his feet and still kept advancing.

But now the anguish of the mother increased; she dashed back to her young, coursed round them with wild cries as if to warn them of danger, and then leaped up before the fragments of rocks already mentioned, from which the second but most difficult egress from the niche was to be won. Again and again did she descend and make the leap, as if to show the young ones the way, but they were unequal to the task, and the hunter was nearer than before, about to make his last effort to gain the prize which had cost him so much hazardous toil. Realising the danger, the mother, fixing her hind-legs firmly on the rock behind, stretched her body to the utmost length, planting her forefeet on the rock above, thus forming of her back a temporary bridge; in a moment the young passed over it, and when the hunter,

making sure of his game, sprang into the niche, all three were off with the speed of the wind, and the bullets he instantly discharged were expended in vain, leaving him to exclaim—

"My gains to-day will scarce
Repay my breakneck toil."

THE GORAL ANTELOPE

(*Nemorhædus goral*)

The Goral is a goat-like antelope and to a great extent connects the goats with the antelopes; it is one of the "mountain-hunting" ruminants. It will be observed, on referring to the illustration, that the animal has a more or less goat-like build. The teeth are also goat-like, the tail is short, the horns are small and cylindrical, but the goral has no beard. It is relatively small as an antelope, standing only about twenty-seven inches high at the shoulders; its limbs are well-boned. The muzzle is naked and the face, as in goats, has no gland below the eye.

THE INDIAN GAZELLE.



THE GORAL ANTELOPE.

The goral is distributed throughout the outer ridges of the Himalayas at an elevation of from three to eight thousand feet, where it is found in groups of about four to eight individuals; but it is not uncommon to find them associated only in pairs, and old bucks appear by all accounts to be generally solitary. Where one goral is seen, the other will almost certainly be found in the neighbourhood, and these animals but rarely forsake their feeding-grounds. When alarmed they are said to utter a kind of hissing snort.

General Macintyre writes that "goral stalking" in the precipitous and broken ground on the middle ranges (of the Himalayas) is perhaps the most pleasant, though not the grandest, kind of mountain sport. The amount of stiff climbing it entails is quite enough to give it zest, without making it excessively laborious. The sportsman can generally return to his tent to rest during the heat of the day, whilst the goral are doing likewise, hidden away among the shady recesses of the rocks, and he can always get back at night to a comfortable bed.

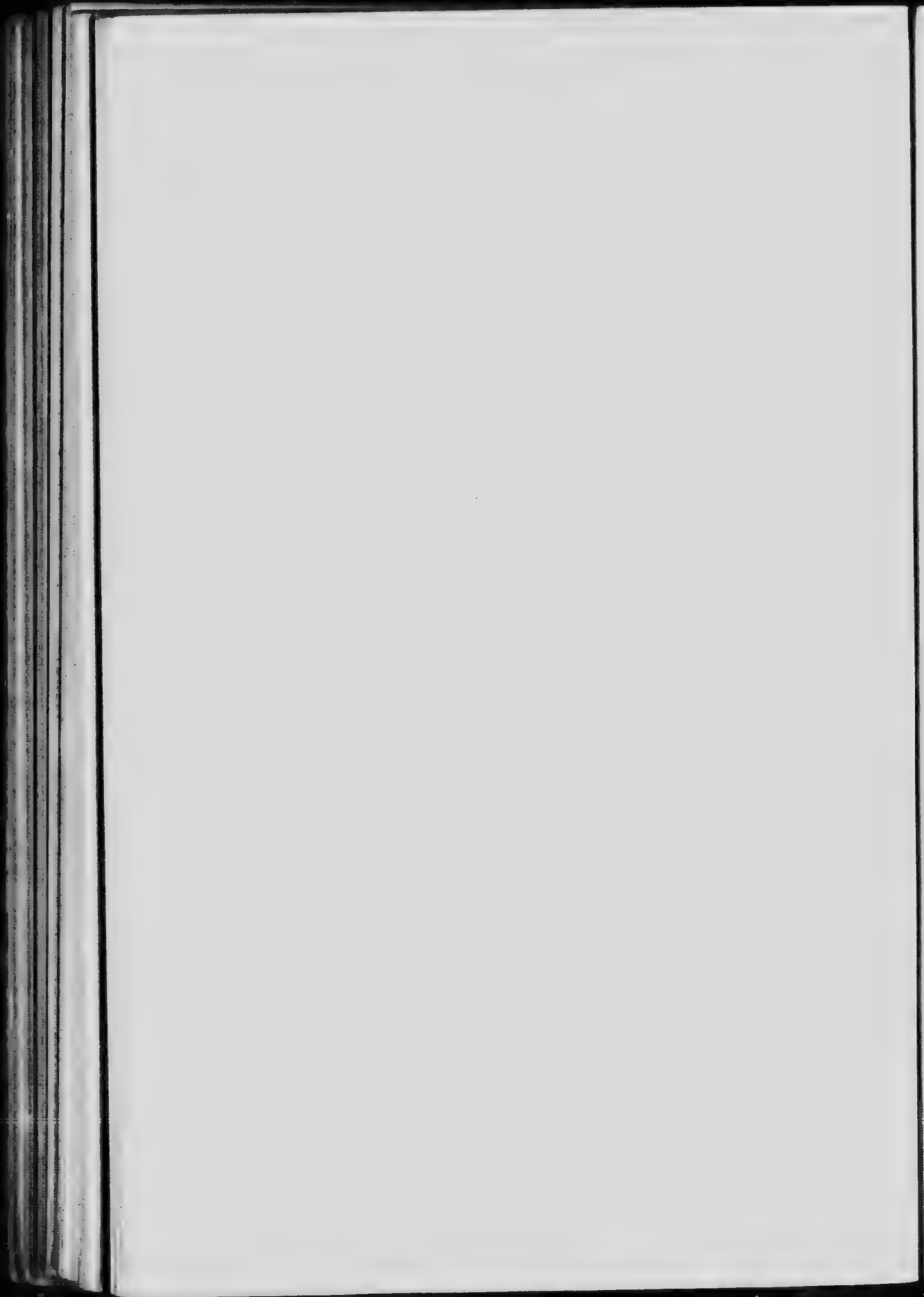
THE TAKIN

(Budorcas Taxicolor)

The Takin is a native of the almost inaccessible mountains of Eastern Tibet and one of the most remarkable members of a group closely allied to the goat-like antelope previously described, although its horns are very differently shaped and its build is clumsy and heavy in comparison with the agile goral. Until within about two years ago most of the accounts written around this animal were conjecture, gleaned from reports given by those who professed to have seen and studied the habits of the animal. It is certainly one of the most scarce animals now in captivity, yet the public pass it by as of little or no importance on account of it showing nothing novel or extraordinary in appearance ; being by habit inactive, it shows little to attract the public, the great majority of which only go to the Zoo to be amused. Until the arrival of this remarkable animal at Regent's Park few Europeans had ever seen, much less shot, the animal.



THE TAKIN.



THE REINDEER

(Rangifer tarandus)

The above animal is the only domesticated species of the family. It extends over the boreal regions of both hemispheres, and runs into several well-marked varieties. Many authors consider the American reindeer (which has never been domesticated) as a distinct species, although the one named above belongs to the Northern Hemisphere of both the Old and New World, where wild herds are still to be found. The reindeer formerly had a much wider geographical range, and is probably the *bos cervi figura* described by Cæsar as inhabiting the Hercynian forest. Both male and female have antlers, and these are not alike on both sides, the great palmated brow-antler being, as a rule, developed on one side only. In the winter the fur is long, greyish-brown on the body; neck, hind quarters, and the belly white. In summer the grey hair darkens to a sooty brown, and the white parts become grey. That the

European winters were much more severe than now may be gathered from Juvenal and Horace (*q.v.*). To the Laplander the reindeer is the only representative of wealth, and it serves him as a substitute for the horse, the cow, the sheep, and the goat. It is extensively employed as a beast of draught and carriage, being broken to draw sledges or to carry men or packages on its back. A full-grown animal can draw a weight of 300 lb. and travel at the rate of a hundred miles a day, its broad, deeply cleft hoofs fitting it admirably for travelling over the broken snow. In winter the herds feed in the woods on the lichens which hang from the trees ; in summer they seek the mountains in order to escape the mosquitoes and gadflies.

THE WHITE-TAILED GNU

(*Connochætes gnu*)

The Gnu stands about four feet six inches at the withers, and one of the distinguishing features of this antelope is

the peculiar curved horns, which are non-deciduous. Some very interesting observations have been published upon the mode of development of these curiously curved weapons of defence, from which it appears that in very young individuals of both sexes the horns grow straight and divergent, situated some inches below the vertex of the head, and separated by a wide hairy interval. These young horns form the straight tip of those of the adult, the basal downwardly curved portion being subsequently developed. Reference to the illustration will show that the base of the horns in the fully adult animal forms a helmet-like mass on the forehead which completely obliterates the hairy frontal space of the young.

The external pony-like appearance of the gnu is certainly extraordinary, and led those naturalists of the nineteenth century who based their classification exclusively on their first impression of the general appearance of the animal into many difficulties and errors. The absence of mane along the throat seems to imply that it has been shifted to the brisket and

chest, and replaced by a hogmane along the ridge of the neck. The great width of its naked muzzle, from which long white bristles protrude, gives this antelope a peculiarly fierce appearance. The ears of the white-tailed variety are small, those of the brindled species being somewhat larger; this latter fact, combined with the horse-like hair of its long black tail, mane, and general pony-like build, induced the penny showman to exhibit the latter mentioned species as the "Horned Horse."

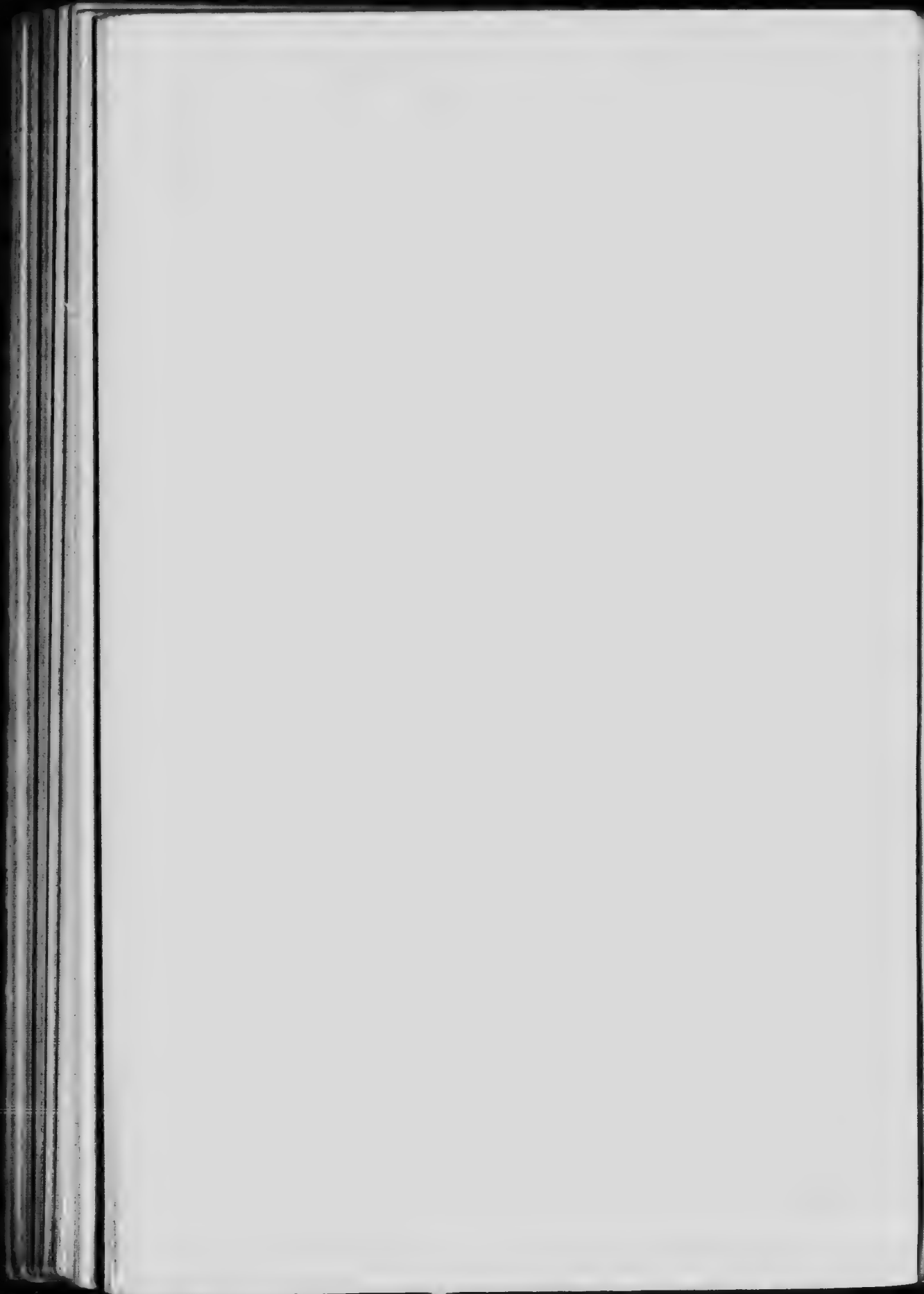
The white-tailed gnu is exclusively found in Africa south of the Zambesi, where it is exceedingly scarce, or shall I say almost extinct? "Sport" and the ravages of the South African War practically slaughtered the entire race out of existence. The gnus have a very extraordinarily acute sense of smell, and are remarkable for their grotesque actions when alarmed. I advise all those interested in one of the scarcest animals, which may never be replaced, to visit the Zoo while they have the opportunity, and note carefully the peculiarities of the white-tailed gnu and the takin.



THE BRINDLED GNU.



THE WHITE-TAILED GNU.



The Brindled Gnu (*Connochætes taurina*), which is distinguished by the absence of the long hair on the face and the presence of dark vertical streaks on the shoulders, is never found to the south of the Orange River.

THE KIANG

(*Equus Kiang*)

These Asiatic wild asses are quite distinct from the African forms ; their colour is a rufous tint, whereas the African asses are quite grey. Their ears are also smaller, and they have the dorsal stripe, but not the shoulder stripe. The Kiang is found in the vast open steppes in Syria, Persia, Afghanistan, the Punjab, and Tibet, from which latter country it derives its name Kiang. It is the largest of the asses, reaching 14 hands. They are in the wild state very inquisitive animals, and when stalking more valuable game these animals are frequently a great nuisance, as they will insist upon galloping down upon the sportsman to make out what he is. When they are not molested, they show but little

fear of man, and will stand and gaze at him from quite a short distance. The rufous-coloured coat with its dark stripe down the middle of the back and the under parts white make the Kiang one of the best illustrations of colour protection Nature has bestowed on animals, and is given as an example by Mr. R. Lydekker in an article on "Colour Protection applied to Animals."

"In one of the side galleries on the ground floor of the Natural History Museum is placed a very interesting exhibit, which too often fails to attract the attention it deserves. A square box, with the front and top of glass, and lined with mottled drab cloth, contains two rough models of swimming ducks suspended on a horizontal bar running transversely through the centre. One of the ducks is covered with cloth similar to that with which the box is lined. The second is likewise covered with cloth of the same description; but the back of the model has been painted brown and the under side white. To the visitor who takes up a position about a yard or two from the front of the box, the uniform drab duck



PRYALSKI'S WILD
HORSES



THE KIANG.

stands out most conspicuously from the background, while the one which has been painted dark above and light below is practically invisible. The reason for this difference is not far to seek. Any solid and opaque object of more or less cylindrical form, such as the body of an animal, supported horizontally in the open some distance above the ground, receives on its upper surface the light of the sky, of which it reflects a larger or smaller proportion according to the nature of its exterior. On the other hand, its under surface is thrown into deep shade, consequently the whole object stands out conspicuously from the background, no matter what may be the nature of the latter." The kiang, therefore, is a typical example of colour protection in animals.

THE PRJEVALSKI HORSE

(*Equus prjevalskii*)

From the appearance of these animals in the photographs they might be taken as a pair of very ordinary Hampstead Heath ponies, costing a few pounds. They are,

however, two of the scarcest animals ever seen in captivity, for which no less a sum than £800 was paid. They were obtained in Mongolia, where such horses have been wild for hundreds of years. These horses can live without food or water for a considerable period, and should make extremely valuable beasts of burden if interbred with hardy Shetlands or New Forest equines. But so far no one except the Duke of Bedford has to my knowledge taken the trouble and expense of experimenting in this direction. In certain respects the Prjevalski horse is an intermediate between the domestic horse and kiang, the wild ass of Asia, both of which have callosities on the hind limbs as well as on the fore limbs, a characteristic non-existent in the African asses.

THE BABY ELEPHANT

(*Elephas Indicus*)

The baby elephant illustrated is one of the gift animals forming the collection known as King George's Indian Collection. It is quite a baby, and still takes its food

through a tube, one end of which is inserted in a pail of milk and the other in "baby's" mouth. It is very amusing to watch this little pet draw its food after the manner of a child with its bottle. This elephant in miniature was captured in its native country quite by accident through falling down a tin mine from which it could not escape, and still bears the mark of its fall in the shape of a nasty wound. It is without doubt the smallest elephant in captivity.

THE ISABELLINE BEAR

(*Ursus isabellinus*)

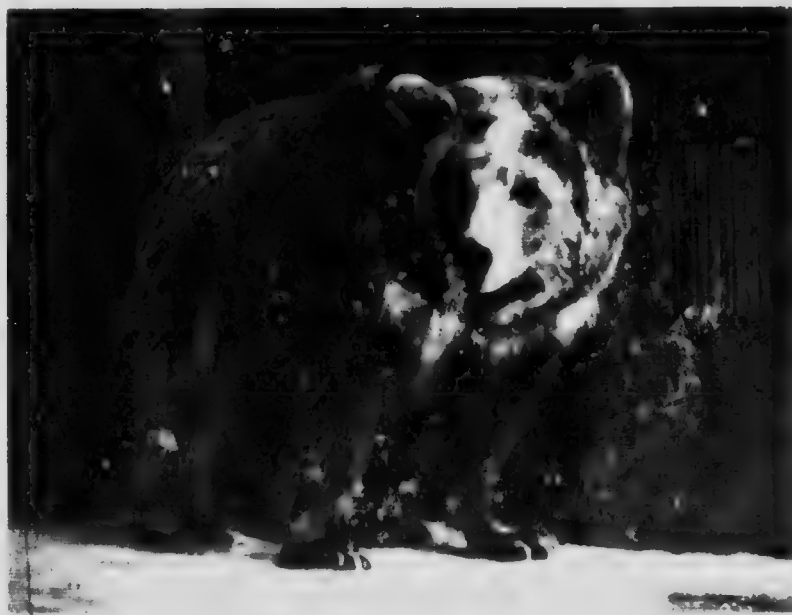
This bear is named after Isabel of Austria, the daughter of Philip II., who at the siege of Ostend vowed not to change her linen till the place was taken. As the siege lasted three years, we may well suppose that the colour of this bear (which is a peculiar shade of dirty brown) resembles somewhat the colour known as isabelline. The bear illustrated is an Old World form, and generally recognised as distinct, with the Syrian and Himalayan, all of which have the same general habits,

feeding on berries, fruits, roots, grubs, insects, carrion, and any living creatures they can capture. Like all other bears, they are fond of honey, and being good climbers, ascend trees in search of the wild bees' nests. It is interesting to note that the buzzing vibrating noise caused by the telegraph wires attached to the tall posts in Siberia induces the bears of Russia to climb the telegraph posts, as they evidently imagine there must be nests of wild bees up there. Reports say that great damage and considerable inconvenience are caused by the destruction of the posts by the bears. The English name "bear" is given to the various species of plantigrade mammals belonging to the *Ursus* and some neighbouring genera. The term *plantigrade* applied thereto intimates that they walk on the soles of their feet, not, like the digitigrade animals, on their toes. Bears, like the rest of the Carnivora, have six incisor teeth in each jaw, yet the tubercular crowns of the molar teeth show that their food is partly vegetable.

The proverbial expression of selling the skin before the bear is caught is no doubt



THE GLUTTON OR WOLVERINE.



THE ISABELLINE BEAR.

the origin of the cant phrase used on the Stock Exchange for one who contracts to sell certain stock not belonging to him at the market price then prevailing.

THE GLUTTON

(*Gulo luscus*)

The Glutton, or, as it is called in America, Wolverine or Carcajou, is a remarkably scarce animal, and it will astonish my readers when they learn that this animal, though a native of America, has been seen but very rarely by Americans, as the following letter which I received from that octogenarian naturalist, Mr. John Walls de Peyster, of "Rose Hill," New York, confirms: "You would be astonished at the labour and expense I have lavished in gathering and reproducing information respecting this animal. I am astonished at the ferocity of your specimen, because I have read in several works that the carcajou becomes gentle and responsive to kindness, even affectionate, and learns to moderate his gluttonous

appetite in captivity. Through the kindness and courtesy of different officials of the principal museums of the world I have obtained photographs of the wolverine or carcajou or glutton, taken from stuffed specimens, but the photographs you kindly send me are unique, as your institution contains the only living specimen of which I have been able to learn in any institution in America or on the continent of Europe."

The legendary tales of Ysbrandt, Blaus, Magnus, Buffon, and many others in regard to the gluttonous habits of this animal should alone make this unique specimen a source of attraction and wonder, and it will interest readers to know that I spent many weary days in obtaining the picture shown, as the animal would get into a violent rage and foam at the mouth immediately I approached with my camera, and continued his violent movements and antics for hours together, until, overcome by exhaustion, he flung himself down for a second in the position shown, rewarding me for my patience.

By far the best accounts I have been

able to find of the habits of the glutton, which holds the unique position of being the only representative of the genus to which it belongs, is that by Sir John Richardson, who writes: "The wo'verine is a carnivorous animal, which feeds principally upon the carcasses of beasts that have been killed by accident. It has great strength, and annoys the natives by destroying their hoards of provisions and demolishing their marten traps. It is so suspicious that it will rarely enter a trap itself, but, beginning behind, scatters the logs of which it is built and then carries off the bait. It feeds also on meadow mice, marmots, and other rodentia, and occasionally on other disabled quadrupeds of a larger size. I have seen one chasing an American hare, which was at the same time harassed by a snowy owl. It resembles the bear in its gait, and is much abroad in the winter, and the track of its journey in a single night may be traced for miles." Mr. Graham observes that "the wolverines are extremely mischievous, and do more damage to the small fur trade than all the other rapacious animals con-

jointly. They will follow the marten-hunter's path round a line of traps extending forty, fifty, or sixty miles, and render the whole unserviceable, merely to come to the baits, which are generally the head of a partridge or a bit of dried venison. They are not fond of the martens themselves, but never fail of tearing them to pieces or of burying them in the snow by the side of a path at a considerable distance from the trap. So pertinacious, indeed, are these animals in quest of slaughtered carcasses, that they have been known to gnaw through a thick log of wood, and to dig a hole several feet deep in frozen ground in order to gain access to the body of a deer concealed by hunters." Another very curious propensity of the glutton is that of stealing and carrying away to some distance articles that can be of no possible use to the animal, and an instance is recorded where the gluttons removed and concealed the whole paraphernalia of an unoccupied hunter's lodge, including such articles as guns, axes, knives, cooking utensils, and blankets.

THE RACCOON

(Procyon lotor)

There are but two species of the Raccoon. The one illustrated is by far the commoner, and is more widely distributed, ranging from Canada to almost as far South as the Argentine Republic. The other, the crab-eating variety, is practically confined to tropical America. Both species are very much persecuted for their beautiful fur, familiar to all.

They are closely allied to the bears, which they resemble in certain anatomical distinctions, but from which they differ markedly in general appearance in having well-developed tails, which may be of great length. Their habits are exclusively nocturnal and they are good climbers, and being practically omnivorous, with perhaps a partiality for a vegetarian diet, will facilitate keeping these as pets. According to P. Wellington Farnborough, F.Z.S., F.E.S., this presents no difficulties. This authority on "Uncommon Pets" states that "raccoons may be purchased alive at the various dealers' for about thirty shillings,

and the crab-eating species for about five shillings more. As a pet this animal has many admirers, and justly so, for after it has become well accustomed to its owner, it dispenses with those spiteful ways which characterise the newly purchased individual. Its peculiar habits, too, make it extremely interesting, as, for example, that of wetting and washing its food before meals in any water which may be conveniently near. The cage ought to be of fair size, not less than four feet long and the floor covered with thin zinc, on account of the splashing of water, and the water vessel heavy, or fastened down, so that it cannot be overturned. When no other domestic pets are about, the racoon may be allowed partial liberty, but if there are any birds about Master 'Coon is pretty sure to have them. As pets, racoons are remarkably hardy creatures, and seven years is not an unusual period of life in captivity; there must, however, be no pampering, as this in itself is prejudicial to the life of nearly all animals."

The manner in which the crab-eating variety secures his prey is interesting. As



it greatly relishes the food which distinguishes its name, it goes to a marsh in Carolina where the crab is very plentiful, and standing on the land he lets his tail dangle in the water. This the crab takes for a bait and fastens his claws therein, whereupon the racoon suddenly springs forward, on feeling the nip, to some considerable distance, pulling the crab along with him. As soon as the crab finds himself out of his element he lets go his hold and falls an easy prey to his sharp-witted antagonist.

THE AMERICAN FLYING SQUIRREL

(*Sciuropterus Volucella*)

Flying is the term applied zoologically to such of the *Sciuridae* (squirrels) as have the skin at the sides very much extended between the fore and hind legs, so as to sustain the animal in the air to a certain extent when taking long leaps. This peculiar mode of locomotion can scarcely be considered a true flight, inasmuch as the cutaneous folds, which serve the purpose of wings, seem rather destined for the mere

support of the animal in its long and apparently desperate leaps, than for raising it in the air and directing its course towards any given object. For this latter purpose they are, indeed, but little fitted by their structure, their lack of proper muscles in a great measure incapacitating them from performing such offices as are dependent on volition. It may be doubted, moreover, whether these animals are entirely destitute of the power of exercising their will in their flight-like leaps. The following authenticated anecdote bears upon this point, and gives place to thought and conjecture on a problem which is still awaiting solution :—

On board a vessel sailing off the coast of New Holland was a "flying" squirrel, which was permitted to roam about the ship. On one occasion it reached the mast-head, and as the sailor who was dispatched to bring it down approached, made a spring from aloft to avoid him. At this moment the ship gave a heavy lurch, which, if the original direction of the little creature's course had been continued, must have plunged it into the sea. All

THE FAT DORMOUSE.



THE FLYING SQUIRREL.

who witnessed the scene were in pain for its safety, but it suddenly appeared to check itself and so to modify its course that it alighted safely on the deck.

There are many species of flying squirrels, but the one illustrated is without doubt the prettiest of them all, and when taken young can be easily tamed, and readily and quickly becomes one of the most charming pets imaginable, and in a very short time makes one of the most tame and confiding of all wild animals. An advantage in making pets of these or any other squirrels is that they do not suffer from any of the usual illnesses due to confinement, except, perhaps, that commonest complaint in all animals, worms, which a little areca nut given daily for about fifteen days will eradicate. The staple diet of all squirrels is nuts, fruit, grapes, dates and grains, such as corn or oats, all of which are readily obtainable. Care should be taken that the drinking water is scrupulously clean, as squirrels are very particular as to what they drink, and will deny themselves this necessity should the water be stale.

THE KINKAJOU

(Potos flavus)

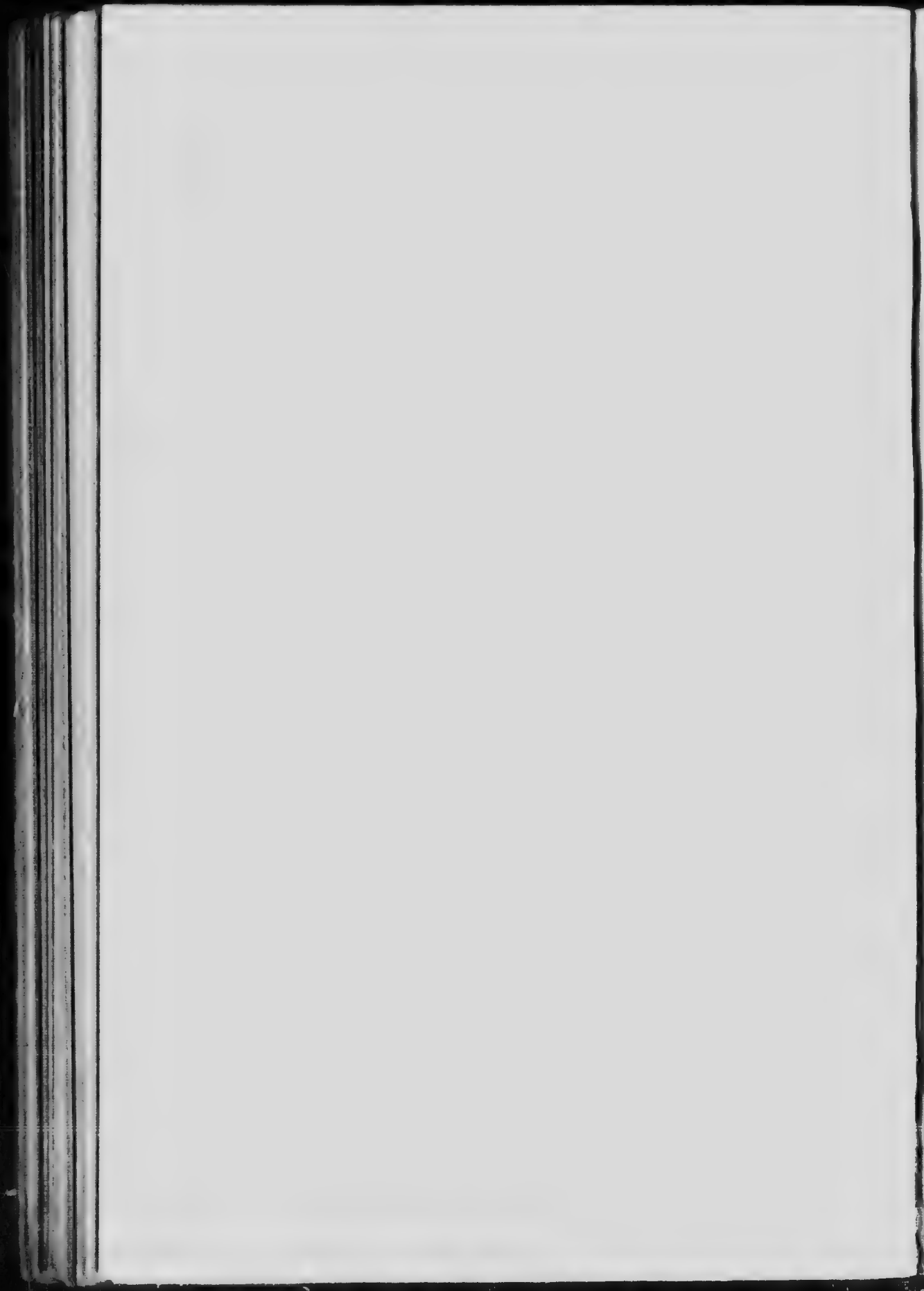
This animal is remotely allied to the racoon, and is a native of the forests of the warmer parts of Central and South America. It is a very remarkable animal, about the size of a cat, and of a uniform yellowish-brown colour. It is conspicuously marked around its large eyes with a dusky circle, and its nose is of the same hue; its long tail is prehensile, but covered with fur, and its tongue long, slender, and very extensible. Its claws are long and hooked, and its progression is semi-plantigrade, that is to say—similar to the bears and badgers, which apply the whole or nearly the whole of the sole of the foot to the ground in progressive motion. Nocturnal in its habits, it remains torpid during the day, rolled up in some dark hole or corner to avoid the light, which it bears with difficulty, contracting the pupil of the eye almost to a point under the influence of the sun or strong artificial light. The Kinkajou is a great destroyer of the nests



THE KINKAJOU.



THE KINKAJOU.



of wild bees for the sake of obtaining the honey, of which it is very fond; the missionaries of Spain have therefore given it the name of the honey-bear. Notwithstanding the assertion that these animals make interesting pets (due no doubt to their aspect, which under an appearance of inoffensive mildness conceals a fierce spirit which is dormant) in captivity, I have experienced a very bad quarter of an hour with one which I was assured was perfectly tame. When one is aware that an animal is spiteful the necessary precautions are taken, but when an apparently docile animal savagely turns on you, it comes as a shock, and I give this warning to those who may be induced to make a pet of the kinkajou.

At one time there was a specimen that was a special favourite at the Zoological Society's Gardens, and was quite an attraction. During the day it reposed in a little inner den, but by no means constantly, as, especially in the afternoon, it came out from time to time and readily engaged in play with those keepers or visitors to whom it was accustomed, pretending to bite and

twisting itself into a variety of droll positions.

It was, however, during the gloom of the evening, when the Gardens were just about to close, that its energy was fully awakened ; then, all play and frolic, it would leap about its cage, climb to the top, and suspend itself with its hind claws and tail to the wires, swinging backwards and forwards in the fullest enjoyment of animal life. During its gambols it was constantly protruding its long tongue, and it did so when the food that it wished to obtain was presented at the outside of the cage. The muscular power which this animal has in gripping with the end of its tail any object from which it desires to suspend itself is remarkable, and it will remain hanging in the position shown in the photographs for hours. Notwithstanding the length of the kinkajou's tongue, it laps like a dog.

THE FAT DORMOUSE

(*Myoxus glis*)

This is an elegant little creature, and closely resembles a lilliputian squirrel in

both form and habit, a fact which closely allies it to that group. Dormice are found only in Europe, Asia (exclusive of India and Malayan regions), and Africa, and are small in size and arboreal in habits. Their similarity in external resemblances to the squirrels is apparently solely due to their adaptation to a similar mode of life, the actual relationship of the dormice being much closer to true mice than to the squirrels. They are characterised by their large eyes and ears and long, thickly haired tails. Their habits are prehensile, which serve it in the dense shrubs and thickets which it inhabits, building its nest amidst the foliage of the underwood of coppices or in the tangled vegetation of hedgerows, feeding upon corn, young hazelnuts, and fallen acorns, laying up a hoard of provisions for the winter, and assuming almost a total torpidity during that ungenial season.

THE AMERICAN BISON

(Bos Americanus)

There are two species of Bison, one confusedly named *Bos priscus* or *Bonassus*, European bison, &c., which was the bison of Aristotle and Pliny. It is often called the Aurochs, which is etymologically the same word as Cæsar's *Urox*, but the two species are distinct: Cæsar's ox is best distinguished by the *Urox*, leaving the word "Aurochs" to be monopolised by the European bison, which was once a British mammal, though now found only fossil. The other, as illustrated, is the American bison, popularly, though erroneously, called the buffalo; it has fifteen ribs on either side, whilst the domestic ox has but thirteen. Like its European congener, it is on the verge of extinction, and as a prey for big-game hunters has virtually vanished, although it is only about thirty years since this was the characteristic animal inhabiting the open plains, where it congregated in vast herds comprising thousands of individuals



THE AMERICAN BISON OR BUFFALO.

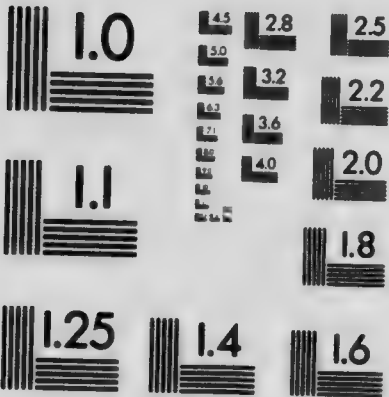


THE TENNESSEE FOX.



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and living entirely on grass. The range of the American bison originally extended over about one-third of North America, and it is asserted that "of all quadrupeds that have ever lived upon the earth, probably no other species has ever marshalled such innumerable hosts as those of the American bison. It would have been as easy to count or to estimate the number of leaves in a forest as to calculate the number of bison living at any given time during the history of the species previous to 1870. Even in South Central Africa, which has been exceedingly prolific in great herds of game, it is probable that all its quadrupeds taken together would never have more than equalled the total number of bison in the New World forty years ago." As an instance of these enormous numbers, it appears that in the early part of the year 1871 Colonel Dodge, when passing through the great herd on the Arkansas, and reckoning that there were some fifteen or twenty individuals to the acre, states from his own observation that it was not less than twenty-five miles wide and fifty miles deep. This, however,

was the last of the great herds; and Mr. Hornaday estimates that the number of individuals comprising it could not be reckoned at less than four millions. Many writers at and about the date mentioned speak of the plains being absolutely black with bison as far as the eye could reach. It would have been poor sport firing into this living mass of blackness, which required no eye of a marksman to bring down a dozen with the same number of shots, even though shooting at random. I agree with Theodore Roosevelt that "pursuit by sportsmen had practically nothing to do with the extermination of the bison." It was killed by the hide-hunters, red, white, and half-breed. The systematic slaughter of the bison for the sake of its flesh and hides, and the ever-increasing demand for "buffalo-robos," as the dressed skins were termed, soon began to tell on its numbers. Up to 1869 the bison occupied one large and continuous area; but the completion in that year of the Union Pacific Railway cut this area in twain, and at the same time divided the great herd into a northern and southern

moiety. Mr. Hornaday also states that it is probably a safe estimate to say that not "fewer than fifty thousand bison have been killed for their tongues alone, and the most of these are undoubtedly chargeable against white men, who ought to have known better."

It appears that the breeding season is from the beginning of July to the end of September, and that the calves are generally born from April till June. The cow does not breed until three years old, and sometimes produces two calves at a birth. Young calves can be tamed with facility.

Towards the end of winter the coat of the bison assumes a bleached or faded appearance from the effects of the wear and tear of the elements. In February the coat begins to change, but the whole process occupies more than half a year. During the shedding the animal presents an unsightly appearance, but by the end of June the whole of the old hair has fallen off and the body is bare, and the naked skin is scorched by the sun

and bitten by flies; the animal consequently protects itself by wallowing in the mud, thus covering itself with a protective plaster of dried mud. It was not until 1883 that the last herd was killed from the great North-western plains; and when the fierce greed of the skin-hunter and skin-buyers had exterminated the last of these great herds, there passed away what was perhaps the most imposing feature of American wilderness life.

THE YAK

(*Poephagus grunniens*)

This Oriental *Bos* connects the bisons with the typical oxen. It is a bovine peculiar to the elevated plateau of Tibet, and differs materially from all other members of the Ox tribe except the European bison, with which it agrees in the number of ribs, both these species having fourteen pairs, as against thirteen pairs carried by the true oxen, and it is a point again worth remarking that the American bison has fifteen pairs of ribs.



THE VIL.

In build the Yak is massively formed, with short and thick-set legs ; both the ears and the muzzle are small, and the dewlap is totally wanting. The horns, which are very large in the bull, are smooth, and nearly or quite cylindrical, with the first curvature of their upper border concave. The weight of a full-grown bull is said to be about twelve hundred pounds. The most distinctive peculiarity of the yak, so far as external features are concerned, is the mass of long hair with which the flanks, limbs, and tail are clothed, characteristics, all shown to perfection in the photograph reproduced, which make this animal so very different in appearance to other oxen. Writing of the yak, General Kinloch observes that, "although so large a beast, it thrives upon the coarsest pasturage, and its usual food consists of a rough wiry grass, which grows in all the higher valleys of Tibet up to an elevation of nearly twenty thousand feet. They feed at night and early in the morning, and usually betake themselves to some steep and barren hill-side during the day. Old bulls in particular seem to rejoice in choosing a

commanding situation for their resting-place, and their tracks may be found on the top of the steepest hills, far above the highest traces of vegetation." Tame yaks are extensively used as beasts of burden in Tibet, where they are extremely valuable in crossing the high and desolate wastes of that region ; they have, however, the great drawback that they refuse to eat corn, so that in districts where there is no grass it is frequently necessary to make forced marches with wearied beasts in order to prevent them (and thus the whole party) from perishing from starvation.

THE WALLABY AND YOUNG

(*Macropus ruficollis*)

The Wallaby illustrated is the rufous-necked species from New South Wales. It is one of the brush-kangaroos which frequent the dense scrub-jungle, and its leaping powers are nearly as great as the true kangaroo's. I should not have included in this volume an example of the genus *Macropus* but from the fact that a statement I made on p. 88 in "Wild



THE RED-NECKED WALLABY WITH YOUNG IN POUCH.

Animals and the Camera" with reference to the mystery surrounding the breeding habits of these marsupials brought me a letter from that great authority, Mr. D. Le Souëf, C.M.Z.S., &c., Director, Zoological Gardens, Melbourne

I had stated on authority that "no authentic record has been taken of the actual transference of the embryo to the pouch," and farther on I stated "the manner by which the transference of the lilliputian offspring to the pouch is accomplished is conjecture." It is sometimes by our errors that we discover the truth; such an experience is mine in this instance, and I have much pleasure in publishing the interesting statement by Mr. Le Souëf, which settles this remarkable question beyond dispute.

"'How does the new-born Kangaroo get into the mother's pouch?' Having seen an article under the above heading in a recent number of the *Zoologist* in which it was stated that there is evidently much confusion on this interesting question, I thought it would be a help to state what has been observed in a wild specimen of

the Grey Kangaroo (*Macropus giganteus*)
When the young one is ready to be born, the mother sits down on the ground, resting on the upper portion of the base of her tail, and with that appendage resting level on the ground in front of her; she then holds her pouch open with her two fore-paws, and, as the helpless mite is born, it rests on the soft fur of the underside of the tail. The mother immediately transfers it to her pouch with her lips only, and eventually with great care attaches it to the nipple. The mouth of the young one is apparently only a round hole, and it as yet has no power of suction; but the nipple is of a peculiar shape, with the point hard, and the mother is thereby enabled to insert it into the mouth of the young one. She then holds it in position while she forces the milk into the nipple, which thereby swells out and holds the young one on; but if, after being once firmly attached, it is pulled off, it cannot be replaced, even by the mother, for the end of the nipple, now being flaccid instead of hard, cannot well be inserted into the mouth of the little one.

"The young one measures about an inch in length when born and is very immature, and its fore-legs are much larger than its hind ones. It has not yet been proved, as far as I am aware, how long after birth the young one is able to draw nourishment for itself—probably three months."

I am very pleased to publish the above letter, which appeared in the *Zoologist*, No. 704, and in which Mr. Le Souëf kindly referred to me.

THE WILD BOAR

(*Sus scrofa*)

The above species is the progenitor of all common swine, and it will be observed that the illustration shows that the face is long and the skull depressed, whereas in the domestic hog the face is shorter and the skull more elevated; otherwise, in form and general appearance they do not materially differ. Into the merits of pork we will not enter, but it is fortunate that multitudes of people enjoy a food which is so easily obtained, for

no domestic animal is so widely dispersed through the world. It thrives and lives on every kind of food, and its stomach can digest what few other animals can swallow with impunity. No animal converts a given quantity of nutritive food so soon into fat, or can be made fat on so great a variety of food. The variety and destructive habits of the hog are too well known to require description here.

THE BABIRUSSA

(*Babirussa alfurus*)

These quaint animals, which were formerly called the stag-hog, are chiefly notable for their four formidable tusks, the two strongest of which proceed from the under jaw, like those of the wild boar. The other two rise like horns on the outside of the upper jaw, just above the nose, and extend in a curve over the eyes, hence the name "eye teeth." They almost touch the forehead and are fully twelve inches in length. The ivory of which these tusks are composed is of

THE BABIRUSSA.



THE WILD SWINE.

very fine quality and devoid of the usual covering of enamel, but not so hard as that of the elephant. There is no record of any satisfactory explanation of the uses to which these abnormally large tusks can be put by the male, which alone has them; those of the lower jaw are doubtless intended as offensive and defensive weapons, but the curved growth of these and the upper or superior pair prevents their proving dangerous instruments of attack, and there seems more aptness in the notion that they are employed to support the head by suspension to a bough whilst the animal is sleeping in the standing position. Even this idea is based more upon theory than actual observation. The form of the animal is not so heavy as in the case of the other species of the hog, and the body, instead of being covered with bristles, is furnished with a very short wool-like hair on a soft and thin skin. These curious and almost hairless pigs are natives of the Eastern islands of Celebes and Bourou.

THE ETHIOPIAN WART HOG

(Phacochærus Æthiopicus)

As a contrast to any one of the species of hogs or swine that may be considered handsome, could any animal be more hideous than the specimen of the above as seen in the illustration on the cover? The circular curve of the tusks is not so pronounced when the animal is in its wild state and seeks its own food, as the points would be kept sharp and worn down by constant use. Captain Sir C. Harris gives a very graphic description of this particular species, as follows: "Returning one drizzly wet morning from the banks of the Limpopo, I chanced upon a very large drove of the unclean beasts feeding unconcernedly on the slope of a hill; the sleet obscuring my rifle sights, I projected no fewer than three bullets at the diabolical-looking boars without touching a bristle, the whole party, with a general grunt, scampering off after each discharge to a little distance, then wheeling about to show a menacing front, exalting their whiplash



tails at the same time, and screwing horrible faces at me ; but the fourth missive tripped up the hoary general, and although *shooting a pig* may sound somewhat oddly in the sporting ears of my brother Nimrods, I can assure them that whilst we had no horses to spare 'the head of that ilk swine' proved a prize well worth the lead and gunpowder that had been expended upon it. Gigantic and protruding like those of an elephant, the upper tusks were sufficiently hooked to admit of the wearer hanging himself up by them to roost, as did his ancestors of yore, if the ancients are to be believed. By all who saw these trophies in the colony they were invariably taken for the ivories of a *Zeekol* (hippopotamus)."

THE SEA-LION

(*Otaria Californiana*)

The Californian Sea-lion may be called the common species, as it is the one most often seen in captivity, no doubt from the reason of its being most easily caught at its

home, the coast of California. But for the timely interference of the United States Lighthouse Board, which stepped in and protected the favourite breeding-grounds of this intelligent animal, it would in all probability have been entirely exterminated. The specimen illustrated represents the species of seal or sea-lion so often seen in shows, and many are the wonderful tricks the remarkable beast performs, some of them rivalling the most expert jugglers seen on the variety stage. The life these poor creatures live "behind the scenes" is really heartrending. The travelling showmen keep their breadwinners in tanks, sometimes not large enough to allow the animal to stretch itself out to its full length. I have no hesitation in stating that cruelty is frequently used to teach these sensitive and sagacious seals the tricks they perform to amuse a yawning crowd, that has paid a penny each for admission and permits cruelty to be committed before its eyes. Not content with using a stick with which to keep the affrighted animals under subjection, a rod of iron or a length of three-eighths gas-tubing I have seen used upon them if

they failed to catch the flaming torch or beat the tambourine to the measured time of the barrel-organ which served as an orchestra. The pain these poor things suffer when travelling in their limited quarters, and the jolting they receive on the rough country roads traversed on their journey from one fair to another, closely packed in a badly built van with all the paraphernalia of a penny show, *may* account for the many abrasions to be seen on their poor bodies and heads, and was readily offered as an excuse by the gipsy showman with whom I remonstrated after seeing the condition of the poor little Californian Sealion, whose expression and plaintive eyes seemed to appeal to me for sympathy. The menacing expression on the bronzed face of the gipsy and the manner in which I was hustled out of the show by his dusky companions were a sufficient hint that it would have been indiscreet to question further such wayfarers as these, who gain their livelihood by the ill-treatment of poor dumb creatures.

THE ELEPHANT SEAL

(Macrorhinus leoninus)

This scarce specimen was captured and offered to H.M. King George as a donation to his African Collection, and hails from the Crozet Islands in the Southern Indian Ocean. It is the largest of the Pinnipede Carnivora (Seals and Walruses) and attains a length of between fifteen and twenty feet. The prefix "elephant" is given to this seal from the presence in the adult male of a proboscis of considerable length, taking the form of a tapering trunk. One of its most striking characteristics is not the length of its proboscis, which will not develop until it reaches a matured adult stage, but the extraordinarily large size of its eyes, which have been compared to the discs of a pair of dark-tinted motor goggles. The massive head is apple-shaped, and it will be observed that the muzzle is short and the nostrils subdorsal in position, behind and outside each of which is a short curved crease in the skin. Directly



THE ELEPHANT SEAL.

above the nose is a crescent-shaped crease similar to that found on the bulldog, and directly above, a second but shorter crescentic crease, from which rises a pair of erect bristles, which Mr. R. T. Pocock was the first to describe. The fore flippers are long and flexible and furnished with five strong claws, which are used for cleaning the face and scratching the body; the latter can also be supported by the fore flippers being turned outwards at the wrist in a similar manner to the sea-lion's. This method of support is unique with the elephant seal, no other true seal (*Phocidæ*) having the same faculty. The hind flippers articulate in the same manner as those of the other species of this family; that is to say, they stretch backward, and are to all intents and purposes clawless.

The elephant seal is no more active on land than the common seal, which shuffles along the ground in anything but a pleasing manner. There is, however, a most remarkable characteristic peculiar to the elephant seal which has given rise to considerable interesting correspondence in the scientific journals. I refer to the

erect position this animal has the power to assume, as shown in the photograph. It being an acknowledged fact that seals are capable of displaying a very high degree of intellectual manifestation, and having watched the development of confidence of this beast in its semi-domesticated surroundings, and the curiosity it displayed when an elephant with children perched on its back approached its quarters, I determined to try the effect of sound upon the animal, knowing its power of hearing to be remarkably acute, as evidenced by the following authenticated record: A little seal which was kept in captivity was so remarkably acute of hearing that even while under water the very faintest whisper of its name—"Jenny"—did not fail to bring her to her keeper's side, with all the expectancy exhibited by a faithful dog.

I had brought with me a pitch-pipe, which emitted reedy sounds, which I had found attracted the attention, and, in some instances, had exercised a fascinating influence over certain animals, whereas very savage and incurious animals ignored its emissions altogether. The seal was

THE ELEPHANT SEAL.



THE WALRUS.

apparently asleep, its head resting on the edge of the cement work which surrounded the pond. At the production of the first sound from the pitch-pipe the animal opened its big, staring eyes and quietly and slowly allowed its body to slide back into the centre of the pond. The curiosity of the animal was evidently excited, as it watched my every movement as I entered the enclosure with my camera ready set for an exposure. I commenced to blow the pitch-pipe, increasing the volume of sound gradually, at the same time waving my hand in the manner of one who induces a dog to "beg." In less than a minute the sagacious creature slowly raised its head, which it threw back as far as possible, and then gracefully elevated itself into the beautifully curved position shown in the photograph, reference to which shows the remarkable hind flippers well out of the water. The curves and line taken up by this animal are most artistic. I had heard of this animal's faculty of posturing, and had determined to make a close study of its habits.

ny may discredit the assertion that

animals can appreciate the difference between sounds, or that certain tones in the scale have a hypnotic influence upon the more highly developed animals, but there is no questioning the fact. In my opinion there is not an animal in the whole of creation that, by domestication, shows more intelligence than the seal, and its acuteness of hearing and appreciation of certain sounds are remarkable. Mr. Low, in his "*Fauna Orcadensis*," relates that in the wild state seals seem to have a great deal of curiosity. If people are passing in boats, they often come quite close up to the boat and stare at them, following for a long time together. If people are speaking loudly, they seem to wonder what may be the matter. "The church of Hay, in Orkney, is situated in a small sandy bay, and much frequented by seals; and I observed when the bell rang for divine service all the seals within hearing swam directly to the shore, and kept looking about them as if surprised rather than frightened, and in this manner continued to wonder so long as the bell rang."

It grieves one to read in a recent number of the *Field* that these interesting animals (the seals) are verging on extinction, as a result of the persecution of whalers in quest of oil. The remarkable difference in the head of the elephant seal and the sea-lion is most marked, as reference to the illustrations of these two animals will show. One might be called the "bull-dog" expression, and the other the "terrier."

PART II

BIRDS

PART II. BIRDS

THE OSTRICH

(*Struthio Camelus*)

THERE is not an exotic bird in the world that is better known by report than that strange, majestic, and fleet-footed creature that "scorneth the horse and his rider," or one that has been so fully described. There must be few persons in any civilised country unacquainted with this, the largest of living birds, whose size is not insignificant in comparison even with the mightiest of the plumed giants that existed of old upon the earth, since an adult male will stand nearly 8 feet high and weigh 300 lb.

The Ostrich seems to have been known and valued for its feathers from earliest antiquity. A graphic account of the bird, with special allusion to its feathers, is found in the Book of Job. Representations of it

have been discovered in the ruins of Theban temples contemporary with Moses. The feathers appear as decorations for robes in the days of Nimrod. Some reckon the ostrich a very stupid creature, but that the bird should be known and its feathers valued all the ages, and yet no attempt be made to tame it commercially, seems to argue enterprising obtuseness, at least, on the part of man.

The first serious proposition with reference to ostrich farming was made by the late Mr. Kinnear, of Beaufort West, in a letter to the *Cape Argus*; but although he demonstrated the profits of the trade, its practicability did not strike the Cape farmers very forcibly. It was not till about 1862 that the business reached an experimental stage, and in 1865 the Government returns showed only eighty tame birds in the country. During the succeeding ten years, however, the industry became a mania, till in 1875 there were not less than fifty thousand tame ostriches, and since then the business has spread into the Orange Free State, the Transvaal, Natal, and—shall we say?—



throughout South Africa. The export of feathers, which in 1875 was £400,000, now reaches millions.

A brief sketch of the many stages of an ostrich's life will be of interest. The period of incubation is forty-two days, or exactly twice that of the ordinary fowl. The size and weight of the egg do not bear a like proportion, for an ostrich egg is from five to six inches through the long diameter, and four or five inches through the short, and the weight is between three and four pounds. An ordinary ostrich egg is alleged to contain as much meat as twenty-four hen's eggs. In the process of artificial incubation, which is largely adopted in breeding ostriches, the young chick can be distinctly heard to breathe in its shell about the fortieth or forty-first day. Its kicking and tapping at the shell may also be heard, and its movements perceived, by placing the egg on a table. On finding its way out of the shell—in which it sometimes requires help—the chick sits down on its haunches and stares about the earth and up to the sky, as if to say, "What does it all mean?" It soon begins to hobble about a little, but

at least two days must elapse before it seems to get any definite idea of the connection of things. In the course of a few days the ostrich chick is quite as large as an ordinary fowl, but it is infinitely prettier. Its lovely eyes, deep, dark, and soft; its shapely bill; its broad, intelligent crown and beautiful neck, both of a rich brown or "bay," elegantly mottled or striped with black; and its close, thick coat of brownish yellow, hid upon the back and sides with black, white, and brown spangles of porcupine-like quills, give it a unique appearance among chickens. In a week or two it is necessary to remove it from its mother, and it is handed over to the care of its keeper, who is commonly called a "herd" boy. At six months the porcupine quills have nearly all disappeared, while the neck, now grown long and more slender in proportion, has nearly lost its beautiful dapples and stripes, which are replaced by an ugly grey down. Its head may now reach the height of an average man. In another six months its neck is uniform grey, with down thin and hairy; the feathers are then perfect and fit to be clipped. If the bird be a

female, the plumage will have assumed a dark grey, the tips of the white feathers visible at the end of the wings and some extending out of the grey feathers of the tail; if a male, the feathers—except for the white on the wings and tail—are black. As will be seen by the illustration, the multiplicity of white feathers shown in most drawings is erroneous. Only a comparatively small tip of these white feathers is visible unless the bird throws out his wings.

During adult life a new crop of feathers would naturally develop to perfection once a year. The farmers obtain three clippings in three years by cutting them at eight months (after the first year) and pulling out the stumps of the quills when they have become dry.

Sometimes at two and a half years, but more generally at four, a change comes over the young family. Some young cock in the troop grows proud and pugnacious. He greets the once-respected herd with a contemptuous hiss, and perhaps without even that warning deals such blows with his foot as will clear the camp effectually.

Some hen in the camp, whose scaly legs and bill now bloom with a rosy tint, surpassed only by the vermilion scales and bill of the cock, approves his valour, and the result is a match.

It has been commonly made to appear that ostriches are so stupid or so greedy as to be totally indiscriminate in the matter of food ; but this is a mistake. Many of a troop will even show delicate choice, but a hungry ostrich will eat almost anything. His system requires food in large quantities, but he always prefers the suitable kind. It is a fact, however, that the ostrich often dies a victim of over-indulgence. It is worthy to note that the ostrich in its wild state will seldom attack a man even in the breeding season ; while on the farms almost every man employed has to be on his guard against some particular bird which, whether breeding or not, is liable to attack him. It seems to be almost a rule that the more domesticated the bird, the more vicious and uncertain is his conduct.

Ostriches have a distinctive pride to rule over their own homes, and will fight an enemy within their own camp with much

greater energy than when they are themselves the invaders. To one unaccustomed to brutal contests, an ostrich fight is really a spectacle of terror, and if the old Romans had only known what terrible creatures they could be made, an ostrich fight would have been a crowning sensation in the gladiatorial arena. On the approach of an enemy, or one considered as such, a vicious bird will challenge the intruder by coming towards him with stately, deliberate strides. He then begins to hiss loudly, like a goose or a serpent, at the same time erecting all his feathers and spreading his wings till he becomes twice his usual size. He then drops suddenly on his knees, appearing, as it were, in a sitting position. Throwing his neck haughtily back over his body, he swings it swaggeringly from side to side, at each movement knocking his head violently against his body. This is called a "challenge," and is similarly given in return by the ostrich taking it up. After several challenges, they come into collision with mad fury, and with their legs deal blows upon each other, first from one side, and then from the other, with tremendous force

and effect. Having fought a round, they retire a space, and then return to the attack till one or the other is killed or bolts off beaten.

The old notion that the ostrich buries his head in the sand, in case of danger, proves to be another of the numerous natural history "facts" which are utterly mythical; but the ostrich is a wonderful paradox, and Mr. E. B. Biggar apologises for disturbing so venerable a proverb, when there are so many equally useful, with the advantage of being true.

The most obvious distinctive characteristic of the ostrich is the presence of two toes only, the third and fourth on each foot, a feature absolutely peculiar to the genus *Struthio*.

THE STANLEY CRANE

(*Anthropoides paradisea*)

Acts of Parliament do not always produce the result that was intended when making the law. Sundry such Acts affording protection to cranes did not prevent these graceful and picturesque

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THE STANLEY CRANE.

birds being driven out of England. Mention is made of cranes' eggs and young in the fen-laws passed at a court held at Revesley. Pennant wrote that after the strictest inquiry he found the inhabitants of this county to be wholly unacquainted with the bird, and hence concluded that it had forsaken our island. The crane, however, did appear in those times, as it does now, at rare and uncertain intervals, and in the most uncommon places, showing that the unfortunate examples that have strayed from the migrating bounds, whose movements are recorded from almost the earliest ages, only visit us to be shot down by the fowler, who gives a hostile reception to any strange visitor which comes within his range.

The beautiful Stanley Crane is one of the handsomest birds of South Africa, common in the mining district suburbs, where they stalk about in pairs on the open flats in search of insects, but also devouring seeds and roots. Their tall and erect carriage and dignified gait, combined with a close-fitting habit of the finest plumage, which often displays

magnificent tail-feathers of a rich black protruding from the general colouring of pearl grey, give them a striking appearance. Their ability of uttering sonorous and trumpet-like notes is most peculiar, the bird having the power to emit its sounds both during flight and while on the ground. In the latter case the head is uplifted, with the open bill pointing skywards during the utterance of the blast so often heard from cranes in confinement, especially at the approach of spring.

THE HERON

(*Ardea cinerea*)

The Heron is not frequently seen in England, except in the Fens. The Common Heron of Europe is the subject of the illustration, and forms only one of about seventy or eighty species which comprise the family *Ardeidae*, which includes the egrets, bitterns, night herons, and boat-bill. The Common Heron is a long-legged, long-necked, long-winged, and long-billed bird, found not only in Europe,

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THE COMMON EGRET

but in Asia, Africa, and reaching as far as Japan and Australia. It is only injurious among fish, which form its sole food. It was often preserved in the middle of the last century on account of its association with baronial sport, when it was the chief of the birds at which the hawk was flown in the sport called falconry, or hawking.

When fishing, which is usually early in the morning and late at night, he stands motionless in shallow water, with his head between the shoulders. On seeing his prey, he thrusts his head as quick as lightning into the water, with a sure stroke. The heron's nest is built like that of the rook, which bird it resembles in habits and other respects; it selects the tops of lofty trees and composes the nest of a huge mass of sticks, often the accumulation of years, lined with twigs, in which it lays from four to six sea-green eggs. Contrary to the young of the crane, which are able to run about almost as soon as they are hatched, the young herons remain in the nest some considerable time. In the adult bird the beak is yellow; iris, yellow; head, greyish white; plume, dark slate

blue. The females only differ in their colours being less bright. In both sexes the plume does not appear until the third year. About forty years ago there was a heronry on Wanstead Flats.

THE MILKY EAGLE-OWL

(*Bubo lacteus*)

This beautiful owl is a native of Africa, and is one of the largest and most powerful of the entire order. These owls are also called horned, and are closely allied to the screech-owls, from which they may be distinguished by the relative shortness of the wings, which never reach within a considerable distance of the end of the tail, while the magnificently barred plumage identifies these beautiful birds. The beak is short and strong, the ear-tufts show the same barred markings on the inner webs, and the impression once made on the observer will always be recalled on seeing this, the most typical and majestic of these nocturnal birds. The Eagle-Owl is the boldest and most rapacious of the birds of prey, attacking and devouring young

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fawns, hares, rabbits, and other small rodents, to say nothing of grouse, pheasants, as well as reptiles and frogs.

The Tawny or Wood-Owl may be regarded as the typical species of the four that are to be found in England. It is the largest of our resident owls, and would be found in much more abundance but for the foolish persecution to which it is subjected, through ignorance and prejudice. It is accused of killing and eating game, but this has been proved to be an erroneous assertion. Like the kestrel, it lives on mice and rats, and "Stonehenge" states that "when it has its young to provide for it will attack the hare or the rabbit. The nests may be easily taken or the owl trapped or shot. A great parade is generally made by the keepers of the owl, as it is a bird which makes a great show among the list of vermin and yet is not very difficult to destroy." Recent correspondence in the Press against the wilful destruction of owls and other wild birds that adorn our woods has proved that many benefits are conferred upon the upholders of game by the owls, their

chief food being vermin, which, as in the case of the rat, not only deplete the nests, but carry with them the germs of fatal diseases.

What is more delightful on a summer night than to hear the "hoo-hoo-hoo-hoo-hoo" break through the stillness and calm? Gilbert White of Selborne writes "that the wood-owls come down from the hanger in the dusk of the evening, and sit howling all night on my walnut-trees. Their note is like a fine *vox humana*, and very tuneable. The owls probably watch for mice about the buildings."

According to the legend, our Saviour went into a baker's shop to ask for something to eat. The mistress of the shop instantly put a cake in the oven for Him but the daughter said it was too large and reduced it half. The dough, however, swelled to an enormous size, and the daughter cried out "Heugh! heugh! heugh!" and was transformed into an owl. Ophelia alludes to this tradition in the line—

"Well, God 'eild you! They say the owl was a baker's daughter."—SHAKESPEARE: *Hamlet*, iv. 5.

THE CORMORANT

(Phalacrocorax carbo)

The Cormorant is a member of a very remarkable family (*Phalacrocidæ*) which comprises the gannets and darters, all of which are to be found as visitants to our shores. These sea-fowl may be characterised by certain peculiarities: their elongated but powerful bodies, neck of medium length, varying considerably in thickness, the plumage of which is without gaps. The legs are short, and the entire family may be readily distinguished by the fact of the whole four toes being connected together with a web which generally extends to the extremities. The face is naked, and the bill is moderately long and narrow. The cormorant will also be recognised by the extreme stiffness of the tail feathers, which number twelve or fourteen.

The cormorant is undoubtedly the most expert of diving-birds, and any one who has witnessed the speed and strength which this bird can exert when pursuing

its prey cannot but admire its aquatic powers.

Feeding almost exclusively on fish, it is the most gluttonous and greedy of all "divers," for even when it has eaten so much that it cannot comfortably swallow any more, it still goes on fishing. Their enormous voracity is remarkable to behold as is also the way in which they dispose of large fish, such as plaice. Aided in great measure by the power of compression and dilatation conferred upon it by the peculiarity of the bone structure at the back part of the head, and the muscles attached thereto, it can control the process of gorging, by increasing the capacity of the pharynx, for the more easy passage of any unusually large fish. This extraordinary apparatus, peculiar to the above-mentioned birds, also permits of the young feeding themselves by poking their heads far down their parents' throats and extracting the half-digested fish from their stomachs.

The cormorant swims very low in the water; even in the sea the body is deeply submerged, little more than the head being visible. It flies with its neck outstretched,

and darts down with lightning rapidity upon any poor fish its keen eye perceives; and although the fish may be one of the swiftest swimmers and have a good start, such is the velocity of the bird under water that it seldom fails to overtake and capture the object of its attack.

Another peculiarity to be observed is that, although a web-footed bird, it perches upon trees, where it occasionally builds its nest, although it mostly selects rocky shores, where it forms its nest of seaweed, and it will be noticed that the ground immediately around it has the appearance of having been bespattered with white-wash. Some varieties select the clefts and ledges of the summit of the cliffs or rocks, giving thereby a hazardous sport to the enthusiastic egg-collector.

The cormorant may be described as an intelligent bird, which, taken from the nest when quite young, may be easily tamed and trained to fish for its master, as was the common custom in England in olden times. It is recorded that in Charles I.'s reign the "corvorant," as it was then called, was specially looked

after by the Master of the Corvorant, who was an officer in the royal household. As recently as twelve to fifteen years ago many gentlemen fished with the cormorant for their own pleasure, and this was considered a delightful sport.

Sir George Staunton ("Embassy to China") states that the Embassy, in its journey to Han-choo-foo, had not proceeded far on the southern canal, when they arrived in the vicinity of the place where the Len-tze, or famous fishing-bird of China, is bred. This bird (an undoubted cormorant) is figured in the Atlas, Pl. 37, and a vignette at the end of the chapter shows two Chinese fishermen carrying their light boat, around the gunnel of which their cormorants are perched. Sir George further says: "On a large lake close to this part of the canal and to the eastward of it, are thousands of small boats and rafts, built entirely for this species of fishery; on each boat or raft are ten or a dozen birds, which, at a signal of the owner, plunge into the water, and it is astonishing to see the enormous size of the fish with which they return grasped

between their bills. They appeared to be so well trained that they did not require either a ring or collar round their neck to prevent them swallowing any portion of their prey, except what the master was pleased to return to them for encouragement and food. So attached do these birds become to their master, that they do their utmost to please him, like a faithful dog, and absolutely understand his meaning, and should one bird capture a fish too heavy for it to carry out of the water unaided, another bird, at the word of command, will immediately fly to its assistance. Fully trained birds are often given permission, after a successful haul, to fish for themselves; but after having their fill, they always return with prize for their master. The apprentices are trained with a leather collar or a metal ring round their necks to prevent them from swallowing any fish, large or small. The boat used by these fishermen is of a remarkably light make, and is often carried to the lake, together with the fishing-birds, by the man who earns his living by their cleverness."

The voracity of the cormorant has often been emphasised, and the evidence collected by the River Tweed Commissioners, who pay a florin for each of the species shot, adds further testimony to that point. During the present year, one bird when opened was found to contain trout half a pound in weight; another had swallowed, amongst other fish, two trout weighing a quarter of a pound each. It is estimated that the life of a cormorant is ten years, and that during that time it consumes about fifty tons of fish.

THE GANNET, OR SOLAN GOOSE

(*Sula bassana*)

The Gannets are gooselike birds, sometimes called boobies, nine species being described. The pair illustrated are the Cape Gannet (*Sula capensis*), which is easily recognised by the black markings on the wings and tail as shown. These interesting birds come to the Bass Rock in March, and, after breeding there, go off in September. They neither come nor

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CAPE GANNETS.

go away all at one time. I have seen thousands of them on this historical resorting place for sea birds, and in conversation with the keeper of the rock was informed that they can scarcely raise themselves off the ground; which is evident when the particular position of their legs and the very extraordinary length of their wings is taken into consideration. When the gannets pass from place to place, they unite in small flocks of from five to fifteen, and except in very fine weather fly very low in single file and with great velocity near the shore, but never pass over the land, always keeping at a respectful distance from it. The natives of St. Kilda hold these birds in much estimation, and often run great risks to obtain them. Where it is possible, they climb up the rocks which they frequent, and in doing this they pass along paths so narrow and difficult that they have scarcely room to cling, and that, too, at an amazing height over a raging sea. Where this cannot be done, the fowler is lowered by a rope from the top, and to take the young ones oftentimes places his life in jeopardy by

stationing himself on the most dangerous ledges. Unterrified, however, he ransacks all the nests within his reach, and then by means of a pole or rope moves off to other places.

By comparative anatomy it has been clearly demonstrated that birds in general are provided with air-vessels in different parts of the body, and that many of the bones are not destitute of this contrivance admirably fitted for increasing their lightness and consequent buoyancy as well as progressive motion through that element in which they are intended principally to move. Mr. John Hunter (in the *Transactions* of the Royal Society) proves that the air-cells, in the parts already mentioned, have a free communication with the lungs, by means of openings on the surface, through which the air passes readily into them, and it clearly appears that there is no diaphragm that confines the air to the region or cavity of the breast, but that the whole of the abdomen is equally inflated by inspiration through the lungs. In the act of respiration there appears to be always some air propelled between the sl

and body of this bird, as a visible expansion and contraction is observed above the breast; and this singular conformation makes the bird so buoyant that it floats high in the water and cannot sink beneath its surface, as observed in the cormorant.

The gannet is capable of containing about three full inspirations of the human lungs, divided into nearly three equal portions, the cellular parts under the skin on each side holding nearly as much as the cavity of the body. Now, as a full or extraordinary inspiration of the human lungs has been considered to occupy a space of about sixty cubic inches, it is interesting to note that the gannet is capable of containing not less than one hundred and eighty cubic inches of air at one time, subject to the will of the bird under certain impressions. The legs are not placed so far behind as in such of the feathered tribe as procure their subsistence by immersion. The gannet, consequently, has the centre of gravity placed more forward, and when standing the body is nearly horizontal, like the goose, and not erect like the cormorant.

By the above observations it will be gleaned that the gannet is not one of the diving birds. It is well known that many birds regurgitate with much ease and facility, and that instinct points out to them the necessity of preparing the food intended for the nourishment of the young in the receptacle usually termed the craw or crop; and although the gannet does not possess one, it can easily disgorged the contents of its stomach to satisfy its young.

The plumage of the adult is white, tinged on the head and neck with buff, while the outer edge and principal quills of the wings are black, and some bare spaces round the eyes and throat reveal a dark blue skin. The plumage of the young is of a deep brown above, but paler beneath, and each feather is tipped with a triangular white spot. The young one is hatched blind and naked, and as the gannet only lays a single egg in a shallow depression, either on the ground itself or on a tuft of grass and seaweed placed upon the bare rock, it receives the undivided attention of its parents.

The gannet captures its prey by closing its wings and dashing perpendicularly on to fish that are near to the surface of the sea, and the velocity with which this action is carried out must be seen to be appreciated.

THE LAUGHING KINGFISHER

(*Dacelo gigantea*)

There are many species of this genus, but space will not allow of mention at length of more than the one named as above. The general characteristics of the family *Alcedinidæ* are nearly identical, the difference being a question of size, colour, and a few minor distinctions. Though superstitions regarding Kingfishers have ceased to influence the belief of any one, yet they still remain as delightful fancies. The Romans had their halcedonia, halcyon days, or days of calm, so called in allusion to the mild and clear weather which was supposed to prevail during the time when this bird was hatching. The kingfisher is still contemplated as the associate of cloud-

less sunshine and it is often alluded to by our poets:—

“Why o’er the verdant banks of Ouse
Does yonder halcyon speed so fast?
’Tis all because she would not lose
Her favourite calm, which will not last.”

The Common Kingfisher (*Alcedo ispido*) is the only species of the extensive genus that is found in Europe, but it differs in no respect from the same bird found in Asia and Africa. The bird illustrated is a native of Australia, and with the other *Dacelo* is popularly called the Laughing Jackass by the Australian settlers. It is a large bird, measuring about 17 inches total length, with a wing about $8\frac{1}{2}$ and a tail $6\frac{1}{2}$ inches, and its general appearance stands out in poor contrast to the beautifully coloured English variety. Gould states that this kingfisher “frequents every variety of situation—the luxuriant bushes stretching along the coast, the more thinly timbered forests, the belt of trees studding the parched plains, and the bushes of the higher ranges being alike favoured with its presence. Its food, which

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THE LAUGHING KINGFISHER.

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is of a mixed character, consists exclusively of animal substances. Reptiles, insects, and crabs, however, appear to be its favourite diet ; it devours lizards with avidity, and it is not an unfrequent sight to see it bearing off a snake in its bill to be eaten at leisure. It also preys on small mammals. Many visitors to the Zoological Gardens are disappointed, when directed to the laughing jackass's quarter, to find that the object of their curiosity is only a small bird and not one of the equine species.

THE RUFF

(*Machetes pugnax*)

The Ruff is celebrated, as its name implies, for its pugnacious habit. It is one of the small wading birds, easy to procure, and makes a most interesting and amusing addition to the outdoor aviary, adapting itself readily to captivity when given a moderately large run containing a shallow pond. Modern Italian writers state that the common name of this bird is "gambetta," which was anglicised by Pennant, and applied to what in Montagu's opinion (*Orn.*

Dict. Suppl.) was a bird of that species in one of its varied stages of plumage ; but it has since been used, especially by American writers, indiscriminately for several sandpipers, of which the ruff forms one of the group.

The plumage of the ruff at certain periods of the year exhibits some very remarkable changes. At the breeding season a most beautiful frill of feathers develops round the neck, which is also variable in colour, and it has been said that no two ruffs have ever been seen alike. Each male, or *ruff*, has his own little walk, which he defends from all intruders, *vi et armis*. The females, or *reeves*, however, are gladly welcomed within the walk, and on their arrival a regular pitched battle takes place between the males, the fierceness of which is shown by the grass being strewn with feathers.

In the beginning of spring, when these birds arrive among our marshes they are often to be seen engaged in desperate battles although when bred in captivity they seldom settle down to real fighting, but only display their pugnacious characteristic by

constantly sparring-up to each other ; yet, withal, they ignore birds of other species. If kept in very close quarters, which is necessary in transport, the ruffs must be separated, otherwise the turbulent prisoners instantly attack each other, and never cease fighting till one is killed. In order to fatten these birds for the table they are shut up in a close, dark room ; this has the effect of taking all the "pluck" out of them, and at the same time hastens the putting on of flesh.

The ruff, when out of his nuptial attire (or, to use the fenman's expression, when he has not "his show on"), and the reeve at all seasons offer no very remarkable deviation from ordinary sandpipers, and outwardly there is nothing except the unequal size of the two sexes to rouse suspicion of any abnormal peculiarity ; but when spring comes all is changed. In a surprisingly short time the feathers clothing the face of the male are shed, and their place is taken by papillæ, or small carbuncles, of bright yellow or pale pink, contrasting in hue with the coloration of the "ear tufts," which again differ in colour from the frill, pro-

ducing thereby a combination of diversity. That all this wonderful "show" is the consequence of the polygamous habit of the ruff can scarcely be doubted. Like other fine gentlemen, Mr. Ruff takes much more pains and trouble with his courtship than with his duties as a husband. Whilst the reeves are sitting on their eggs, scattered about the swamps, he is to be seen far away dancing and sparring with his companions. Yet, whilst he is making love, nothing can be more expressive of humility than some of his actions. He throws himself prostrate on the ground, with every feather on his body quivering and standing on end, giving the impression to an observer that he feared approaching too near to his mate. If she flies off, he starts up in an instant to arrive before her at the next place of alighting. All his actions are full of life and spirit, but none of his enormous exuberance is expended on the care of his family. He never troubles himself to protect them from an enemy; in fact, he tires of and deserts his love even before the hatching of his offspring. The reeve, seeming to realise his neglect, becomes dull and settles down into

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a state approaching lethargy. The breeding grounds of these birds extend from Great Britain across Northern Europe and Asia. The birds leave our shores in the late autumn and winter in India, reaching even Ceylon and Africa as far as the Cape.

THE OSPREY

(*Pandion haliaëtus*)

The Osprey or Ospray is said to be a word corrupted from "ossifrage," or bone-breaker. Pliny and some other classical writers, when mentioning the *Ossifraga*, seem to have intended to describe the Lammergeyer, which, as its very name shows, is the reputed enemy of shepherds, and it is in some measure owing to their hostility that the osprey has been extirpated in so many parts of its European range. Whichever of the "bone-breakers" was intended, the reason for the appellation is the following: When a young mountain-climbing animal is seen by the osprey to be in a dangerous position, the bird swoops down, and so terrifies the poor beast that it loses its foothold and falls down a

precipice and becomes dashed to pieces and having a great partiality to bones, the bird swallows those small enough and slowly digests them. It is said to soar to a great height with the large bones and drop them on a rock or stone, so that they may be broken into pieces of convenient size. Hence the name given by the Hebrew (*peres*) is rightly translated in the Authorised Version of the Bible (Lev. xi. 13; Deut. xiv. 12), but was corrupted into osprey and misapplied to a bird which has no habit of the kind.

The osprey is only found on the sea coast or very near it, and is about the size of the golden eagle, from which it differs both in colour and choice of food, which is composed entirely of fish. In the salmon fisheries it sometimes is a sad depredator, especially when the salmon leap, which is their habit when near the sea. Here it will seize the fish as they are struggling up the fall, and if once it takes to this dainty, it is sure to return to it. The osprey is less wary than the golden eagle, and may generally be approached with care while "fishing" for its prey.

The osprey is one of the most cosmopolitan birds of prey. From Alaska to Brazil, from Lapland to Natal, from Japan to Tasmania, and in some islands of the Pacific, it occurs as a winter visitant or as a native. The lover of birds can scarcely see a more enjoyable spectacle than that of an osprey engaged in fishing—poising itself aloft, with upright body and wings beating horizontally, ere it plunges like a plummet beneath the water, immediately after to reappear, shaking a shower of drops from its plumage.

A few years ago some of the best informed ornithologists were led to think that persecution had extirpated the osprey in Great Britain, except as a chance visitant. This opinion proved to be incorrect, as the bird is believed still to breed in at least two counties in Scotland, which shall be nameless. Few birds lay eggs so beautiful or so rich in colouring: their white or pale ground is spotted, blotched, or marked with almost every shade of purple, orange, or red—passing from the most delicate lilac, buff, and peach blossom, through violet, chestnut, and crimson to a nearly absolute black.

THE WEAVER BIRD

(Ploceus Bengalensis)

Although the majority of nest-making birds may be called Weavers, there is one family to which the name is with real justice applied. These are the remarkable birds which are grouped together under the name of *Ploceidæ*, all being inhabitants of the hot portions of the Old World.

Protection is no doubt the primary motive for building these nests suspended in mid-air from the slender branches of trees; curiously enough, the Weaver Birds must have some design in selecting certain trees, particularly when other trees equally available for all practical purposes, though lacking in grace, are near at hand. For the most part the weaver birds suspend their nests to the ends of small branches, palm-leaves, or reeds, and many hang their nests over water, and at no very great height from the surface. The object in selecting this very curious locality is evidently in order to protect the eggs and young from the destructive ravages of the

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NESTS OF THE WEAVER BIRD.

innumerable monkeys that swarm the forest, and whose filching paws would rob many a poor bird of its young brood. As, however, the branches from which these fantastically shaped nests are picturesquely hung are very slender, the weight of the monkey, however small the animal may be, is sufficient to cause the immersion of the would-be thief in the water, and so to put a stop to his marauding propensities. It is well known that the monkey race are very partial to little birds, mice, or eggs, and that they have such a predilection for blood that they will snatch the feathers out of parrots' tails in order to suck the raw and bleeding quills. Snakes too, also inveterate nest-robbers, some of them living almost exclusively on young birds and eggs, are effectually debarred from entering the nests, so that the parent birds need not trouble themselves about either foe. Although the weaver bird is quite small, measuring only a few inches in length, the nest which it makes is of considerable size and fashioned in fantastic shapes. Some are not unlike the form of a Florence oil-flask,

supposing the neck to be shortened and widened, the body to be lengthened, and the whole flask to be enlarged to treble its dimensions. The illustration shows two nests, one not unlike a sabot. Here will be a perfect wine-glass, there a goblet, and indeed almost every conceivable shape and form which can be bounded by a curve is constructed, the caprice alone of the individual builder seeming to govern the fashion. And the evidence of constructive harmony and order between the materials of the nest and its surroundings cannot be laid entirely to the effort at concealment, for although the nests illustrated could have been built in many a hiding-place, they were most conspicuously erected in a spacious outside aviary where a number of weaver birds were kept. Had the birds wanted seclusion during the interesting building operations they were executing, they could readily have selected their indoor quarters.

These Baya and Bengal weaver birds seemed to enjoy being watched during the progress of their ingenious nest-plaiting. The manipulation of the grasses and stalks



and other materials which were placed within their reach was indeed remarkable, especially when it is considered that they have only their bills with which to weave the interlacing warp and weft of their artistic and symmetrical structure. The outside of the nest is left with the stems of the grass protruding like "quills upon the fretful porcupine," and, it has been asserted, this is an effort of protection from snakes and monkeys; but whether it really affords any obstacle is open to doubt. Much more protection is assured from the fact of the nest hanging in mid-air and its constant movement in the breeze.

The interior of these nests is finished with the utmost care, the ends of the grass stalks being tucked in so that no projections may come in contact with the tender skin of the unfledged youngsters. The thick ends of the stalks are so arranged that they point towards the mouth of the nest, which hangs downwards, serving the purpose of eaves whereby the rain is thrown off the nest as it dangles at the end of the fragile support, seeming to dance merrily with every gust of wind.

The birds I had under observation show the same love for brilliancy and colour as the records of travellers show. I had placed in the aviary pieces of gay-coloured Berlin wool and short lengths of string which I had dyed with various bright anilines, and the resulting nest was interwoven with a certain amount of taste, the tints seeming to have been chosen with a view to harmony of colour.

It will be claimed that it is going too far to assert that all birds are moved by an artistic sentiment, but this much at least is proved, that most birds are artists in effect, and that many, including the bower and weaver birds, are artistic both in intention and effect.

THE WYDAH BIRD

(*Chera procne*)

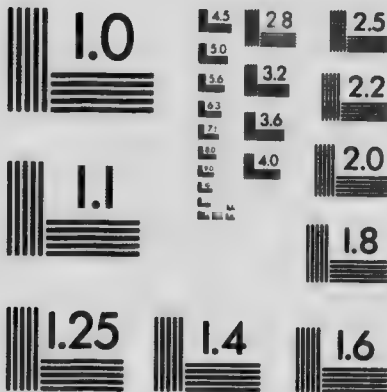
The long-tailed weaver bird must not be confused with the preceding genus, which is an Indian bird, for the Wydah Bird, or to be more correct, Wydah B. (from a place on the West Coast of Africa so named), is one of the genus *Vidua*.

which are only found in Africa. The Portuguese of Africa call this bird the Widow, from its colour and long train, but considering that it is the male bird that has the extraordinary growth of tail-feathers at the breeding season, the Widower would have been more appropriate. Bird dealers call it the Twelve-tailed Wydah, and although the feathers are not of an equal length, each one is sufficiently long to constitute what one may reasonably call a tail. This bird is a finch, but, unlike most finches, does not hop in its progression, but walks on the ground after the manner of a lark, which it resembles in size, but not in flight, being a very feeble flyer. The nest of these birds is built low to ground, in the long grass or reeds of the swampy ponds, and, presumably on account of the abnormal length of the tail, the male bird cannot fly against the wind, and in the rainy season rarely moves out of the thick bushes in which he hides himself; but out of season, when he is without his nuptial livery and long tail-feathers, his flight is normal. Following the custom



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of some of the natives of Africa, he is not content with one mate, and it is asserted that up to fifteen females can be counted to one male.

The Kaffir children find great sport in catching the "widows" by stretching lines covered with a sticky substance similar to our birdlime, across the millet and corn fields, and thereby capture a considerable number through their tails being caught in the lines. As suggested in the short description of the bower and weaver bird, the Wydah is never more happy than when "showing off" to the hens, which look on in rapture at their future lord and master making evolutions in the air and spreading his tail out in the wind like a fan. The colour of the bird is black, with the exception of a scarlet and buff bar on the upper wing coverts. Nothing more graceful could be conceived than this bird when in flight, the tinge of red and buff on his wings contrasting beautifully with his otherwise sombre hue.

THE BOWER BIRD

(Ptilonorhynchus)

It is a distinctly marked characteristic of most members of the feathered family to show a love for the beautiful, and it is therefore not to be wondered at that the desire and ability to create the beautiful are to be found in various degrees of development among birds which, by their own outward appearance, would not be reckoned among the lovely specimens whose range of colours almost baffles the artist's palette. During the period of courtship the male birds show an appreciation of what is beautiful in form, colour, motion, and sound. Many male birds develop a wonderful increase in brilliancy of plumage combined with a radical change in its colouring. The voice, dumb for months, takes upon itself exquisite tones, and the sober plodding after the necessities of life gives place to the most fantastic activity.

All lovers of birds have watched with interest the endeavours of a male bird to gain the favour of the coquettish female.

The most casual observer of the device which he can best exhibit his newly found beauties of person, voice, symmetry of motion, cannot mistake the object of his possession of grace and beauty. The vanity of such birds as the peacock plainly shows that birds appreciate the beauty of their plumage, for not only does he do so, but others, such as the bird of paradise, exert the utmost care in keeping their feathers free from ruffle or spot, but they delight in adding to their charm by devoting hours to their toilet.

In the whole range of ornithology there is not a more singular phenomenon than the fact of a bird building a beautifully symmetrical and artistic structure merely for amusement or the exercise of an æsthetic perception, and decorating it with brilliant objects, as if to mark its distinction. Why the 'bower' birds should trouble themselves to make this bower far from their nests in order to have a meeting-place for social intercourse with others of their kind is a problem as yet unsolved. Had the structure served in any way as a protection there would have been a self-evident reason.

for its existence, but the arching twigs are put together so loosely yet symmetrically that they cannot protect the birds from the rain or wind. Whatever may be the object of the bower, the birds are so fond of it that they resort to it during many hours of the day, and as proof of the bird's appreciation of good work, a well-constructed bower is seldom left without a temporary occupant.

The illustration shows a bower built by a pair of these sober-coloured little birds which were in captivity, and the small choice of suitable material with which to build the structure made it impossible for them to complete it in anything approaching the æsthetic and decorated edifice which we are told these birds naturally construct in their native habitat, Australia.

The bower is first started by the formation of a platform or foundation made up of twigs, which the birds plait together most ingeniously; along the side of this case are planted twigs, which the birds select with due regard to their length and which they firmly stick into the ground, always taking care to insert the thickest end, and they are

so planted that the tapering stems curve inwards to meet at the top the twigs planted at the other side of the case. After a few of these are planted, the birds get some distance away from their handiwork in order to obtain a better view ; and should the form displease them, they will uproot the offending twig and replant it, care being taken that no projections occur within the bower which might hinder the free movement of the bird or its rapid ingress or egress. Days are thus spent in building up the bower and strengthening and entwining thinner twigs at the base of the curved and arched stems in order to give strength to it.

We have a very interesting description of the bower built by these clever little builders by Mr. Coxen, of Brisbane, who was the first to ascertain with certainty that the artistic and ingeniously constructed bowers which were found in New South Wales were the unaided work of a bird little larger than a starling. The curious structures were always found decorated with ornamental objects, in search for which the bird must have travelled miles.



Shells, pretty pebbles, feathers, bleached bones, seeds, teeth, and in fact anything that is decorative, are brought and placed in no haphazard fashion around the bower. All this is done under the supervision of the female bird, who seems to act as the architect and master builder, the male taking the position of journeyman builder. When the structure is completed, pathways are marked out at each end of the bower by means of pebbles, while little ornamental hillocks are erected before each entrance.

Everything being completed, invitations are conveyed to birds of the same species, and a festive gathering is held. The males strut about and exhibit their fine feathers and graceful carriage, while the females look on in rapt admiration, thus reversing the order observed in human assemblies. Then dancing takes place, though, whether for modesty or conscience scruples it is not known, the males and females dance singly and never in pairs of opposite sexes. The final results are, however, believed to be the same, and frequent marriages follow such meetings as this. There is no law of divorce or breach of promise in Birdland.

These birds are allied to the common starling, and belong to a small group of that family which have gained the name of Glossy Starlings on account of their satiny like plumage. The plumage of the male is a rich deep purple, so deep, indeed, as to appear black when the bird is standing in the shade. The female is not in the least like the male; her plumage is almost uniformly olive-green. The young male is coloured in the same manner.

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PART III

AMPHIBIANS AND REPTILES

PART III

AMPHIBIANS AND REPTILES

FROGS

Ichthyopsida (Fishes)

Amphibia

INSIGNIFICANT as the animals described under the above title may appear, there are many remarkable facts and details surrounding the peculiar metamorphosis of these amphibians that cannot fail to be of interest. Their inclusion will be welcome, if only from the fact that their unique characteristics may be watched and studied in one's own home, with but small expense and the exercise of little trouble.

Although looked upon by some with the same abhorrence as reptiles, these harmless creatures are often made pets of by ladies (ladies, it may be said, of peculiar taste). Many records, by undoubted authorities,

exist of frogs which have shown a particular fondness for the individual who has looked after their wants. It is recorded that one used to come forth from its retreat under the garden steps at the approach of dusk and seemed to enjoy being taken up and placed on the table to be fed.

The antiquity of the frog can be traced down the Scriptures; and although it is not recorded that Moses mentioned them by name, he stamped them as being unclean by saying: "Ye shall not eat of anything that moves in the waters, unless it have fins or scales." Aristophanes, the greatest of all the Greek comic and satirical poets, gained the first prize in 405 B.C. with his classic "Frogs," which with his "Birds" ranks as the most popular of Greek plays.

The division in zoology under which frogs are included is *Ichthyopsida* (Fishes) and they are classed as *Amphibia*. As in fishes, *branchiæ* (gills), adapted for breathing air dissolved in water, are always developed for a longer or shorter period. On the other hand, the amphibians differ from the fishes in the fact that true lungs are always present in the adult, although

they play a comparatively unimportant part in respiration, the process of breathing being chiefly dependent on the porous nature of the soft, moist skin. The limbs of the frogs are never converted into fins, nor do amphibians ever inhabit the sea.

The development of the impregnated ova takes place altogether outside the body of the mother, and is attended with marked metamorphosis, principally connected with the fact that the life of the frog commences as a water-breathing larva or "tadpole," provided with gills, which are replaced by lungs in the adult condition. The larvæ are also at first limbless and furnished each with a swimming tail, whereas the adult has limbs and is without a tail. Another remarkable characteristic is that the larvæ are vegetable feeders, whereas the adults are carnivorous.

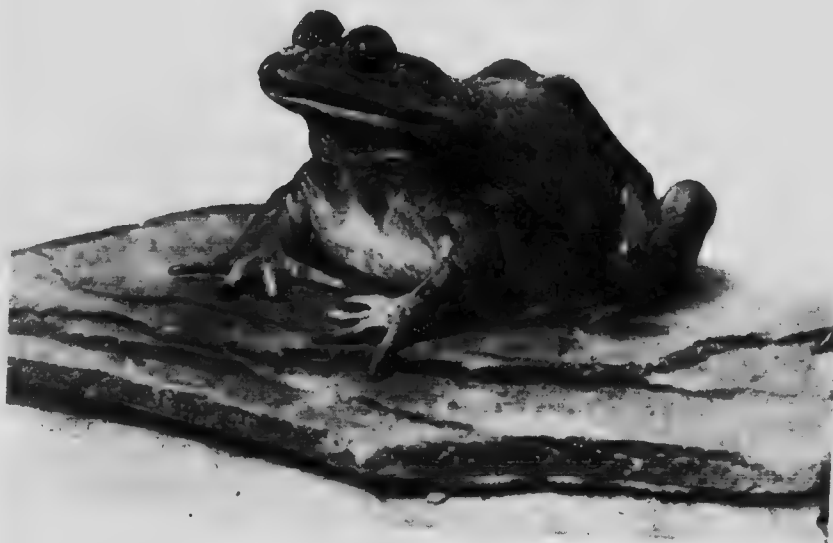
THE EDIBLE FROG (*Rana esculenta*) is not well known in Great Britain, except by repute. Prized on the Continent as a table delicacy, the demand in France is so great that considerable quantities of the common frog (*q.v.*) are sold as the true edible and eaten by foreigners as such.

Grenouilles are offered for sale in the French markets ready skinned, and as the hind legs only are eaten, these are strung together by the score, and it requires an expert to detect the difference, although the flesh of the common frog is slightly darker, but as the vendor of the spurious article never keeps the genuine one, the comparison cannot be made.

Great cruelty is practised in Paris upon these harmless creatures, as the following account by Francis Buckland, the great naturalist, goes to prove:—

“ I went to the large market in the Faubourg St. Germain and inquired for frogs. I was referred to a stately-looking dame at a fish-stall, who produced a box nearly full of them, huddling and crawling about and occasionally croaking as though aware of the fate to which they were destined. The price fixed was two a penny, and having ordered a dish to be prepared, the Dame de la Halle dived her hand among them, and having secured her victim by the hind legs, she severed him in two with a sharp knife; the legs, minus skin, still struggling, were placed on a dish, and the

GOLDEN TREE FROGS.



THE AMERICAN BULL-FROG.

head with the forelegs affixed retained life and motion, and performed such movements that the operation became painful to look at. The legs were afterwards served up fried in breadcrumbs, and most excellent eating they were." However much one may admire Mr. Buckland as a writer of natural history curiosities, he will never be accused of being humane after owning to the enjoyment he experienced in eating the legs of the poor frogs he had watched struggling in horrible torture to satisfy his gastronomic depravity.

Frogs make useful and interesting garden pets, for they destroy insects and other plant pests. Their prey is caught by means of the tongue, which is inserted into the front of the mouth, and when the animal is at rest lies with its point towards the throat. The moment the frog observes an insect within its reach, it suddenly thrusts out its tongue, and the little victim is secured on its glutinous extremity.

THE AMERICAN BULL-FROG (*Rana Catesbyana*).—The European frogs are mere dwarfs in comparison with the bull-frogs of the West, some of which measure

upwards of nine inches from head to body. This species, it will be observed, has the tips of the toes pointed, and it is especially characterised by the large size of the aperture of the ear, and the web extending to the tip of the fourth toe of the hind foot. The markings of the bull-frogs are more distinctive, as will be observed by comparing it with the illustrations of the edible frog.

The loud bellowing noise which it emits is responsible for its being named "bull-frog." The shrill sound is produced by a peculiar piece of mechanism. Certain portions of the larynx (the arytenoid cartilages) are convex externally and concave internally, so that when the larynx is closed they form a dome over the windpipe, which Cuvier has compared to a kettledrum.

The bull-frog is a curious creature in its movements on land. It will take up a position and retain it for days, remaining the while as motionless as the Sphinx; when suddenly it will take a leap which will land it in such a position as is shown in the illustration, and remain there motionless for some minutes. I have closely

observed these creatures in captivity, but have never yet heard one bellow, though Americans declare that the noise they emit can be heard at a distance of several miles.

THE GOLDEN TREE FROG (*Hyla aurea*) is a native of Australia, distinguished by its markings of stripes and spots of a metallic lustre resembling gold, and contrasting vividly with the brilliant green of the body and limbs generally. The green tree frog (*Hyla arborea*) is also exceedingly pretty, and specimens may be purchased for a few pence. They make most amusing and useful pets when put to the same use as they are to this day in Germany, where they are made to answer the purpose of a barometer. They are kept in tall, wide-necked bottles, half filled with soft water, into which a miniature wooden ladder (weighted at the bottom with a piece of tea lead and reaching up to the neck of the bottle) has been placed. The rungs of the ladder mark as it were the degrees of the barometer; the frogs always go towards the top in fine weather, and descend at the approach of bad weather. The Germans consult their frogs when starting on a

journey, and assert the prediction deduced from the position of the frog on the ladder to be in advance of that from scientific instruments.

These little animals, measuring about an inch and a half in length, have the power of varying their colour after the manner of a chameleon but not to the same degree as, a chameleon. They are also provided with suckers at the end of the toes, which enable them to climb and climb readily even on glass, wet or dry. It is also to be noticed that the feet are quite free from web. They are pretty and interesting animals to keep in a fern case, provision being made for them by the insertion of a flower-pot saucer filled with water. They will keep down insects, but will require feeding when they have freed the case of pests. Flies and other insects should then be introduced, or the common white butterfly, to which they are very partial.

TOADS

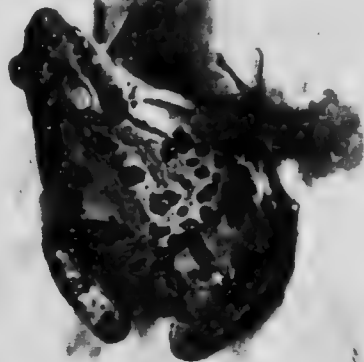
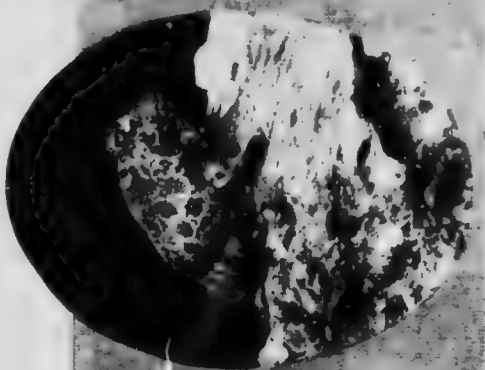
THE COMMON TOAD (*Bufo vulgaris*)

This practically harmless animal has probably suffered more from popular superstition

THE COMMON ENGLISH TOAD.



THE ORNAMENTED CERATOPIHEL.



THE EDIBLE FROG.



THE TIGRINE FROG.

tion than any other in the entire animal world. It has been wellnigh universally detested and shunned, though undoubtedly the most familiar amphibian. It belongs to a group characterised by the absence of a fold on the ankle, the possession of an entire tongue, and by the pupil of the eyes, which are horizontal and prove very beautiful, being red and gold.

In colour, the upper parts of the body are brownish, with brindled markings, graduating to a stone colour or whitish under part, and covered more or less with black spots. Its distribution may be considered as almost universal, as it includes Europe, Asia (exclusive of India), and the north-western division of Africa.

Sluggish and terrestrial in its habits, it is easily captured; its comparatively thick skin, covered with rough warty prominences, prevents it slipping through the fingers like the slimy frog. Nature, however, provided all toads with a more or less protective faculty in the form of an acrid secretion, irritating though not poisonous, which they have the power to exude from their skin when alarmed or threatened by

danger. A toad will, when attacked, swell out its body to its utmost capacity and likewise discharge a limpid fluid from a special reservoir. Its food consists of worms and insects of almost any kind, and half-grown mice it will take freely, but refuses anything that is not living, and indeed, will only take it at the moment when it is in motion.

The spider is a great enemy to the toad. The toad, when fighting with a spider, is said to make use of a herb to preserve itself from its poison, of which I have the following authenticated story: "A certain earl travelling near Woburn, in Bedfordshire, espied a toad fighting with a spider under a hedge by the highwyside. The toad withdrew several times from the attack to eat a piece of a herb like a plantain. At last the earl, having seen the toad repeat this action often, ordered one of his pages to uproot the herb. Once again the toad, after being struck by the large spider, turned to seek the herb, and remained motionless on the spot where it had stood, and gradually swelled and burst asunder. Nature had taught the toad the virtue

that herb to expel and drive out the poison received from the spider, but, wanting the antidote, the poison instantly did its work and destroyed her."

An instinct in dogs deters them from taking up a toad with the mouth, although I have seen a bulldog foam through incautiously mouthing one, the exudation of the acrid fluid by the toad making the dog instantly drop it; the irritating action of the secretion troubled the dog for some considerable time.

Sluggish and slow in their movements, toads are more easily caught than frogs, and cannot so easily escape from a garden, in which they will be found a useful and interesting addition, as they soon rid the beds of plant pests. They are very long-lived, and soon become tame and show a certain amount of intelligence; not being possessed of teeth, they cannot bite, but will hold on to anything with their powerful jaws.

THE ORNAMENTED CERATOPHER.—One of the most tenacious and pugnacious of the *Leptodactylidæ*, which, for want of a better name, is often called the Southern Toad.

The best known representative of the ten species which comprise the family is the Horned or Ornamented Ceratophor, found in the greater part of South America. This species is characterised by the absence of webbing of the hind toes and the bony style of the breast-bone, while the horizontal position of the pupil and the notching of the tongue distinguish it as a genus. The specimen illustrated is one of a species abundant in many parts of the Argentine, and is remarkable for its fierce and carnivorous habits and the brilliancy of the coloration of its skin, which is of a greenish yellow, covered with tubercles of an olive hue, surrounded by golden margins, with wine-red lines or ornamentations between the spots. The enormous proportions of the mouth of these Escuerzos, as they are locally called, give them a most formidable appearance, and their looks do not belie them. They are exceedingly bold and ferocious, "flying" savagely at any one approaching them suspiciously, and fastening on to them with a grip which they maintain with the tenacity of a bulldog, at the same time uttering a cry resembling



the bark of this dog, although erroneously said to be dumb. On other occasions Ceratophers will give vent to a peculiar bell-like sound. The illustrated specimen was photographed when in captivity; it was very difficult to find in the vivarium, as it had the habit of burying itself in the shingle, showing only a very small part of the back, which blended with the colour of the small stones. This is the natural position taken up by the animals when in repose or waiting for prey; the latter may be anything, such as a bird, frog, or small mammal, which latter they will attack, although too large for them to swallow, their gigantic mouths no doubt misleading them as to the capacity of their stomachs and their ability to gorge.

THE BLACK-PAINTED TEGUEXIN

(*Tupinambis nigropunctatus*)

The greaved lizard, as this denizen of the New World is termed, takes the place of the true lizard of the Old World, and is one of the largest and best known of the Teju or Jacuara, which range over a

large portion of South America. The specimen photographed measures about a yard in length, and the teju may be recognised by the tail being round at the root and but very slightly depressed halfway down its great length. It cannot be considered a water lizard, for although found in the neighbourhood of water it apparently never enters it. Should it be chance roam to an inhabited district, it shows a retiring and shy disposition; but if driven into a corner by the dogs employed in its pursuit, it shows fight, hissing and striking with its long, muscular tail with considerable strength, protruding its forked tongue and taking up a very menacing position, which, combined with a mouth opened to an enormous extent, gives it a very formidable appearance which often scares its pursuers. It lives chiefly on such living creatures as it can capture, and is also very fond of eggs. The female lays about fifty to sixty hard-shelled eggs about the size of a pigeon's. The legend that they utter a warning sound on the approach of wild beasts (whence they are sometimes called safe

guards) is apparently without foundation. They are to be found in quantities in sugar plantations.

THE FRINGED GECKO

(*Ptychozoum hamalocephalum*)

The above-named Gecko is the sole member of its remarkable species.

The Gecko illustrated is the sole member of the genus above named, and is characterized by the presence of an expansion of skin along the sides of the body, combined as lobes on the tail, as well as by the toes being completely webbed and the inner one devoid of a claw. Thanks to the enthusiasm of that great supporter of the science of Natural History, Mr. Walter Rothschild, I was enabled to photograph a living specimen of this scarce reptile, which, with the next described reptile, he sent a special commissioner thousands of miles to obtain.

There is something very weird and uncanny in the appearance and movement of this strange-looking animal, with its dabs or patches of greyish-white, which are no

doubt protective markings, as is proved the fact that since the reptile has been in captivity its general colour and the whiteness of the patchy markings have changed perceptibly, and assumed an appearance nearer the colour of its present surroundings.

Although this Gecko is between seven and eight inches long, its colouring and general broken-up form blend so perfectly with the stones and shingle of the vivarium that a casual observer would pass the reptile without noticing it. It is a native of Madagascar; and we read in Flancour's "*Histoire de l'Ile Madagascar*" that it lives on flies and small insects, and has the power of attaching itself to trees by means of minute sharp claws at the tips of its limbs, chin, and tail, which, although not visible, give this reptile the power of attachment to a degree almost incredible. So strongly can they fasten themselves to a branch that in attempting to remove it the impression is given of its being glued to the branch. The tail, too, has some special function in this marvellous faculty of attachment. The natives call

this reptile "famocantrata" (the beast that springs on the chest), and assert that on any one approaching a tree where one of these Geckos is resting it would leap at his chest, and instantly attach itself so firmly that it could not be detached without removing the skin with a razor.

THE GALAPAGAN LAND IGUANA

(*Conolophus subcristatus*)

These remarkable reptiles created quite a sensation among naturalists when it was announced that Mr. Walter Rothschild had secured seven specimens. It was, unfortunately, not long before their numbers were reduced to one specimen, which remained on the shingle with closed eyes, and which was kept alive for a short time by food which had to be forced into its mouth.

Darwin, in his account of the Galapagos Archipelago ("A Naturalist's Voyage," chapter xvii.), gives a full description of these remarkable iguanas, living in multitudes ("we could not for some time find a spot free from their burrows on

which to pitch our single tent") on Indefatigable Island, which is the more extraordinary considering that the entire "archipelago is entirely formed of volcanic rocks; a few fragments of granite, curiously glazed and altered by the heat, can hardly be an exception." Mr. Walter Rothschild gave me special facilities for securing photographs of these scarce lizards, and I am sure he will not object to my publishing a portion of one of his letters to me on the subject:—

"The Iguanas are *Conolophus Subcristatus*, sub-species *pictus*, described by myself in a footnote in my article on the Galapagos, in Vol. 6 of the 'Novitates Zoologicae,' and subsequent volumes. They are entirely terrestrial, as opposed to the famous marine iguanas (*Amblyrhynchus cristatus*) of the Galapagos, and live in subterranean burrows. Their food consists of cactus-shoots and fruit entirely and they were brought by Mr. R. H. Beck, on his last voyage, when he had them on the vessel for nine months before reaching San Francisco."

THE CHAMÆLEON LIZARD

(Chamæleolis chamæleontides)

The lizard illustrated in this volume, although it bears a close resemblance to the true chamæleon (a series of photographs and a description of these curious and interesting lizards were given in "Wild Animals and the Camera"), is in no way related to the *Chamæleon vulgaris*, although probably many non-zoological persons seeing a specimen for the first time would class it with that group. Comparisons of the two photographs will show the close resemblance between the two creatures, both of which possess a similar helmet-like form of head and a laterally compressed body, with a wheel or roach-shaped back terminating in a long tapering tail. Careful examination will, however, reveal the essential difference in the structure of the two creatures; for instance, notice the scale-covered skin of the chamæleon lizard in place of the minute granules which dot the skin of the true chamæleon. The former also lacks the remarkable "tele-

scopic" eye. The equally remarkable divided feet, and the indispensable prehensile faculty of the tail which forms the steadying support to the body of the chamæleon against the shock which would otherwise upset the balance of the animal when his tongue is brought into action are wanting in the chamæleon lizard. It is therefore conclusive that the "chamæleon" lizard is not a chamæleon except in its prefix, and its external resemblance is one of those inexplicable Natural History puzzles yet to be solved.

THE HORNED LIZARD

(*Phrynosoma cornutum*)

This strange creature, which bears a resemblance to the popularly known spiny-tailed lizards, is a native of Texas and Mexico and is at the same time one of the most peculiar members of the family. One would not call this lizard ugly, although its appearance is not likely to create a feeling of admiration. In spite of its spiky and otherwise formidable appearance it is quite harmless, not even attempt

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THE CHAMELEON LIZARD.



THE SPINY-TAILED MASTIGUE.

THE HORNED LIZARD.

THE GALAPAGAN LAND IGUANA.



THE FRINGE-TOED GECKO.

to bite when captured. Not being possessed of the protrusive tongue of the chameleon and being unable to run quickly on account of its clumsy form, the horned lizard cannot capture the swiftest insects, and consequently contents itself with a diet of sand-haunting beetles, whose fleetness is inferior to its own. Most interesting to relate, some species of horned lizards are remarkable as being the only members of the family (save one other genus) which produce living young, as many as twenty-four being given at a birth.

The most remarkable peculiarity connected with these lizards is their habit of ejecting jets of blood from the eyes, apparently as a means of defence.

The following letter from Mr. V. Bailey, written from California, describes the phenomenon as first observed by him:—

“I caught a horned toad (lizard) that very much surprised Dr. Fisher and myself by squirting blood from its eyes. It was on smooth ground, and not in bush or weeds. I caught it with my hand; a little jet of blood spurted from one eye, a distance of fifteen inches, and spattered on

my shoulder. Turning it over to examine the eye, another stream spurted from the other eye. This he did four or five times from both eyes, until my hands, clothes, and gun were sprinkled over with fine drops of bright red blood. I put it in a bag and carried it to camp, where, about four hours later, I showed it to Dr. Fisher, when it spurted three more streams from its eyes."

THE SPINY OR THORNY-TAILED MASTIGURE

(*Uromastix acanthinurus*)

This is a North African species of the lizard. They are readily distinguished by their short tails, covered with well-defined rings of spiny scales. It will be observed that the head is remarkably short and rounded, the body depressed; there is no crest on the back nor folds or pouches on the neck. In colour they match the sombre hue of the desert regions which they frequent, and they are not insectivorous, but live entirely on vegetables. They are solitary in their habits or live

in pairs, and are timid and gentle in their disposition, rarely if ever attempting to bite when captured. They are most suitable as pets, not only on account of their disposition, but from the fact that they are so easily fed. The Arabs make great pets of them and keep them in captivity; and their flesh is much relished as food, being considered superior to the tenderest of young chicken. The writer cannot conceive any one keeping animals as pets and killing them off for food, although it is a common occurrence to kill the pet rabbit for a Sunday's dinner among the working class.

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